

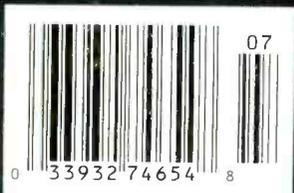
Monitoring Times[®]

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- **SPECIAL REPORT: Radio After the OKC Bomb**
- **Air Boss on Wheels: Have Tower will Travel**



Will Your Scanner Be Locked Out of the Action?





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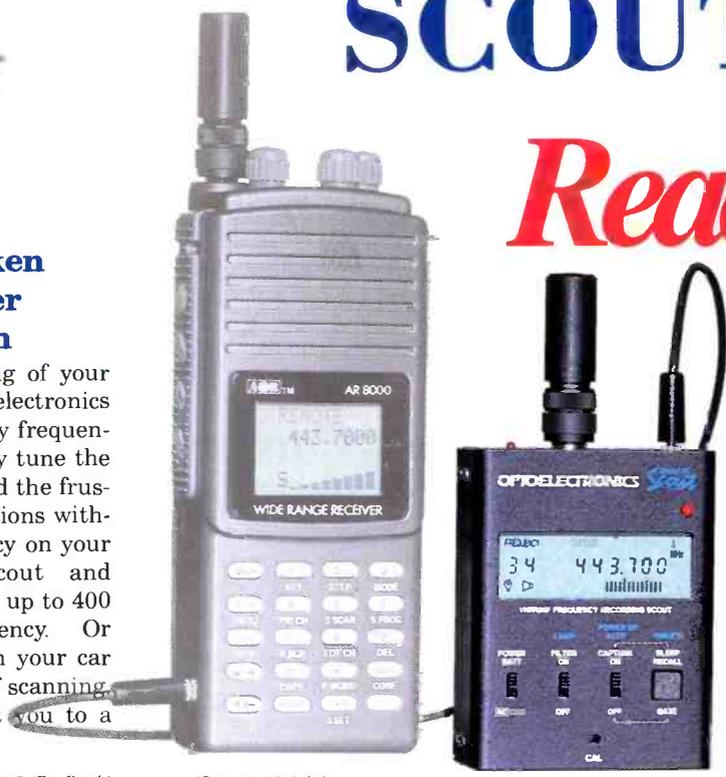
Featuring Automatic Tuning of your AR8000 and AR2700 with the Optoelectronics Exclusive, Reaction Tune (Pat.Pend). Any frequency captured by the Scout will instantly tune the receiver. Imagine the possibilities! End the frustration of seeing two-way communications without being able to pick up the frequency on your portable scanner. Attach the Scout and AR8000/2700 to your belt and capture up to 400 frequencies and 255 hits per frequency. Or mount the Scout and AR8000/2700 in your car and cruise your way into the future of scanning. A simple interface cable will connect you to a whole new dimension of scanning.

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Vol. 14, No.7

July 1995



Cover Story

Project 25: Will Scanners be Locked Out of the Action?

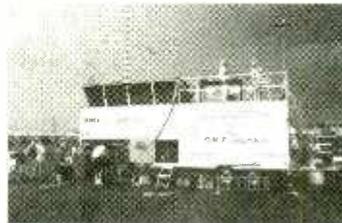
By Kirk Kleinschmidt

Project 25 is a proposed set of standards for government and public safety communications radios. APCO, the Association of Public-Safety Communications Officials, Int'l, is the prime mover behind this effort to set common standards and increase the flexibility of communications systems. As the potential for Project 25's adoption draws closer, scanner manufacturers and hobbyists are watching to see whether the public will be given access to unscrambled digital communications, or if this means a gradual end to scanning as we know it.

For more background on this important story, turn to page 9. Cover background photo by Garry Watts. Digital composite by John Bailey.

Air Boss: Control Tower on Wheels 16

By Patrick Griffith



While scanning at an air show, the author was surprised to hear someone called "Air Boss" controlling all aircraft instead of the local tower. Curiosity led him to this very unique, traveling control tower. Keep an ear cocked at your local air show—you never know where "Air Boss" may make his next appearance.

Mediumwave Mini-DXpeditions 20

By Mark Connelly

Not all DXpeditions have to involve a weekend camp out to some remote beach location; quite impressive long-distance catches are possible even from the car radio on your way home from work. But will you be ready? Here is some advice from an expert on how to be prepared for the "mini-DXpedition"!



OKC: The Radio Aftermath 26

By Glenn Hauser

MT's shortwave expert and Oklahoma resident reports on the media's coverage of the Oklahoma City bombing and the sudden media interest in the anti-government programming aired by some shortwave stations.

Russians in the Savannah 28

By Mikhail Timofeyev

During the Cold War, the Soviet Union aided many countries in the construction of broadcasting facilities in an effort to spread their influence. Those aging facilities are today in dire need of maintenance. This is the story of Engineer Vladimir Rogal's successful rejuvenation of one station—Radio Conakry.



Leroy Schum: Homefront Hero

Story by Barbara Blossom. Armed with only a shortwave radio, and with the unwitting aid of Axis Sally, Schum (and many others like him) brought a little comfort to the families of soldiers missing in action. See page 30.

Reviews

The new PRO-2037 from Radio Shack could be described as a desk-top version of the PRO-62 scanner. A full review can be



found on page 100. Always on the prowl for new, interesting, and helpful

products, our writers report this month on JRC's NRD-93 shortwave receiver, Metex and Radio Shack interfaceable multimeters, the DigiField field strength meter, several types of software including K&L Technology's Message Tracker, Computer Aided Technologies' CopyPro, Hoka Code 3, and more!

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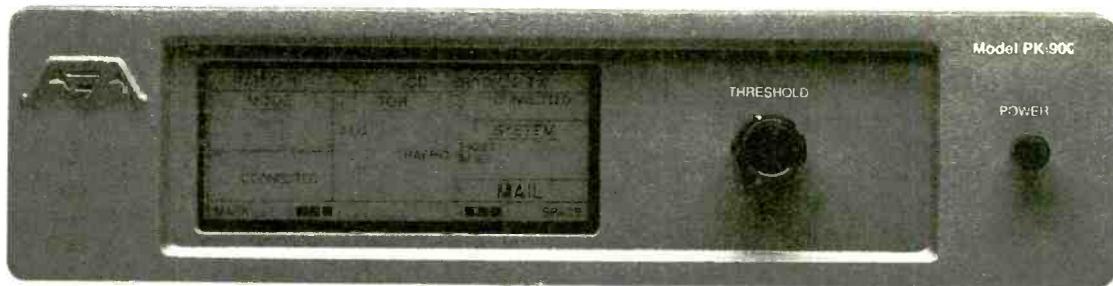
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In Hertz there is no East nor West ...

■ Well, you all had a little fun at our expense, responding to the "unusual orientation of the cardinal points on the map on the May issue's cover," as Charles Rick Williams of Seven Fountains, Virginia, put it. He goes on, "As fate would have it, I was spinning the tuning knob on my Drake R8 and just happened upon Tom Valentine's Radio Free America on WWCR when the cover caught my eye. Suddenly it was all very clear. There on the cover of *Monitoring Times*: THE NEW WORLD ORDER!"

As editor, I should have taken more notice when Art Director John Bailey told me he had a slight problem with dyslexia. Now the faux pas has inspired him to "wax poetic":

"I've no problem distinguishing my verbs from my nouns,
Nor do I confuse my derriere with a hole in the ground,
But when it comes to directions, I'm dyslexic, and must confess:
If I tell you to go East, you might oughta go West."

No Ground to Stand On

■ Following up on Joe Carr's examples of crazy antenna grounds (May issue), Bill Edwards, K5CN, of Corpus Christi, Texas, couldn't resist adding his true story.

"Back in the early 1940's, when Radio was King, a man lugged his table-top, domed radio into a shop for repair. When the repairman later began his inspection of the radio, he found the problem was a simple one, and soon corrected. However, he could not suppress his laughter at seeing a short wire connected to the Fahnestock ground clip, with the other end stuck into the middle of a tuna fish can filled with earth.

"Diplomat that he was, he let the happy customer take his radio back, playing, with no alterations in the 'grounding system.'"

The Oldest Station

■ With reference to the "Oldest Radio Station" (see May "Letters"), John M. Rubin of San Francisco, California, has a claim to stake: "In 1912, Charles Herrold started weekly arc phone (spark transmitter) music broadcasts from San Jose. They were daily during the 1915 San Francisco Panama-Pacific Exposition. The station was banned in 1917 due to World War I. In 1921, Herrold started KQW with the new triode technology. KQW eventually moved to San Francisco and became KCBS (not KCBS-TV, Los Angeles). KCBS claims, therefore, that it goes back to 1912."

What Ferndale FCC Office?

■ When Bob Crane of C. Crane Company in Fortuna, California, read May's "Closing Comments," he was surprised to read one of the offices listed by the FCC for closure was Ferndale, California. Crane says, "This base has been closed for about one year, and is definitely not an FCC office."

"This was a U.S. Navy base set up for the purpose of listening to submarines. I, in fact, went to the location to 'watch submarines' when I was younger. Rumor was they had miles of cable laid into the Pacific with microphones to listen for Russian submarines. On the beach indeed two cables about 2-1/2" in diameter were usually exposed as they headed out into the ocean.

"We got to watch them lay cable one day with a huge amphibious vehicle capable of crashing through six foot waves with no problem. Old broken cables on the beach exposed the innards of perhaps the best coax ever made. The center conductor was 3/8" in di-

ameter and solid copper. The 2-1/2" outside was sheathed in almost indestructible stainless steel, woven mesh. I'm sure the cost was quite a few hundred dollars a foot. I considered using it for my scanner feed line, but just cutting it would take two hours per cut and Radio Shack was all out of fittings for RG2million."

Going by the Numbers

■ Noted inventor, Al Gross, W8PAL, of Youngtown, Arizona, says, "I couldn't resist responding to the October 1994 issue with the article about the CIA/NSA stations in northern Virginia and their transmissions of numbers.

"Having been involved with the Office of Strategic Services (OSS) during WW II (the predecessor to what is now the CIA), and having limited training in cryptography, I thought it would be of interest to see a bit of numerical coding with some references of where to read about the subject.

"I have enclosed a 'Fractional Grid' to show a clever form of coding or encryption in which care must be taken to make sure the 'key' word or words that are used do not have repeat alpha characters (such as in 'commission'). A word like 'carpet' or 'water' is ideal.

"There are two excellent books that may still be available in libraries or book stores: *The Code Breakers* by Kahn and *Cloak and Cipher* by Dan Moore/M. Waller. Dan Moore was my mentor for cryptography. Should this be of interest to your readers, 1534 3223 4544 3221 15 2532 4415 4432 5132 23 (3).

"Hint: the 'Key' word is 'Fraction(a)l' and variations of the numbering can be used, such as 1 to 5 and 6 to 0 on top and side. Knowing what and where the key word is and goes is one of the secrets." (Partial solution on page 114.)



"Danger, Danger, Will Robinson!"

■ Occasionally Larry Miller enjoys exposing some of the more outrageous claims made for "high technology" to the gullible public. Joe Ayala of Santa Maria, California, caught on quickly to the "Powertip" antenna booster announced in May's "What's New?" column, especially since he recognized it for what it really is.

(Continued on Page 114)

Monitoring Post Mascot

■ Melinda Sparks of Christmas, Florida, sent a picture of her (unnamed) boyfriend's listening post. She says, "I know as a fact that the system works much better with the cat attached."

Here's a list of what this very complete post contains. Receivers are: Radio Shack PRO 2023 and PRO 2006; Bearcat BC 300; Regency MX 5000 and HX 1500; two AOR AR 1000s; two Sony Air-8s; and a JRC NRD 525 for shortwave. A Grove antenna preamp, Datong FL-3 audio filter, and an audio patch bay put the finishing touches on this well-organized post.



Special Pre-Publication Offer!

Passport to World Band Radio, 1996 Edition

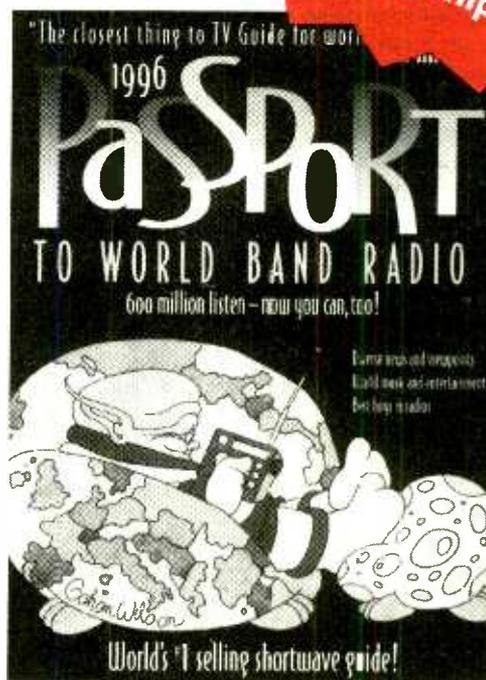
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No Police Eavesdropping

■ Florida's Supreme Court dropped the gavel on residents' right to privacy, upholding a lower court ruling that said police had no right to eavesdrop and then charge someone with a crime.

Police in Broward County arrested Joyce and Adgardo Mozo on drug charges based on evidence from

cordless phone conversations. In June of 1991, police purchased a scanner and began monitoring cordless calls in search of lawbreakers. Upon hearing a man ask a woman named Joyce if she had "the same stuff that she had last night," and Joyce answering

that she "just had powder, no rock," police staked out a Harbor Town house.

Observing a stream of visitors coming and going, they got a search warrant and found cocaine, marijuana, and drug paraphernalia. The Mozo's claimed in court that their constitutional rights were violated. The circuit judge agreed with the state prosecutor that cordless calls had no expectation of privacy. That decision has now been overturned by the state supreme court.

No Money, No Radio System

■ Legislators in Florida found out recently that their plans were bigger than their pocketbooks. The 1988 estimate for a new radio system came to \$167 million, but today the same project has increased in cost to \$367 million. "If we continue on the course we are on, we are headed for a crash, simply because the funding is not there to carry it out," said State Rep. Randy Mackey. "My bottom line is to protect the most law enforcement officers I can, as quickly as I can...but the original plan has to be pared down."

Authorities say that major cuts to the project could leave dangerous radio dead spots, jeopardizing officer safety. The system is designed to replace unreliable 1950's vintage

radio in the Florida Highway Patrol and to link five state police agencies on a common radio network. The first phase in the Dade-Monroe area was built, tested, and put into operation in 1994; the second phase extending the system from Ft. Lauderdale to Daytona and Orlando is under construction. No funds exist, however, to take the system to the 45 percent of the state remaining.

San Diego County Goes for 800 MHz

■ Add two more California towns to the list of cities who are raising taxes to pay for a new 800 MHz radio system. San Marcos and Vista voted to add a tax to pay for the county's proposed \$28 million trunked system. Sheriff's deputies communicate on 453 MHz frequencies, while the Fire Department uses 154 MHz.

A trunked system would put all services on the same band, and allow easy communications with nearby cities like San Diego and Escondido, who already operate on 800 MHz. Residents are expected to pay between \$10 and \$15 per year to pay for the new system.

LAPD Digital Daze



■ A new \$14.1 million radio system will allow Los Angeles, California, police officers to communicate securely. The Motorola Astro Saber radios are already in the hands of officers in Van Nuys and Foothill Divisions, but it will take up to two years before all divisions have the radios. When they do, scanner listeners will be shut out. Sergeant Kurt Miles, head of LAPD's Radio Technology Unit, said that the new system and its encryption capability are a privacy tool needed to protect officers.

Scanner Listening = Wiretapping?

■ They say that David Triska has been fooling around with radios ever since he was nine years old. Unfortunately, his lifelong hobby has come to a rather abrupt halt. Denver, Colorado, Police are saying that Triska

"crossed the line between radiobuff and wire-tapper." A police raid on Triska's home in Federal Heights revealed radios, cables, and electronic equipment that Denver PD says allowed him to infiltrate the police communications system. Though he has yet to be charged, Denver PD believes that he has violated felony eavesdropping laws.

Triska isn't happy about doing without his radios, which were confiscated in the early part of March. "They're the gestapo of Colorado," the 51-year-old Triska says of the Denver police. "They want complete control over who listens to their radio systems." Denver PD Detective Richard Mumford counters by saying, "He's not Mr. Innocent."

Denver Police claim that Triska "has been able to figure out how to program in all the department's talk groups" including so-called off-limits narcotics and surveillance freqs. Triska claims that he ordered the equipment to monitor the system legally from the manufacturer, Ericsson G.E.

The Paranoia Club

■ Just because I'm paranoid doesn't mean they're not out to get me. Shortwave's WWCR radio, perhaps playing on fears generated by the recent federal building bombing in Oklahoma, has switched to a "Super Patriot" format.

The Doomsday programming touts alleged conspiracies by the federal government, while commercials hawk everything from freeze-dried foods to books to gold coins. According to Mike Callahan, who hosts the hour-long "Protecting Your Wealth" program, "If we continue on this path, if this continues unaltered, it will prove fatal to our republic."

Doomsday conspiracy mongers have jumped on the right wing shortwave bandwagon, not only on WWCR, but on WRNO, WHRI, and WINB as well. WWCR's general manager George McClintock defends the programming, saying, "From a commercial point of view, one way or another you must extract



WWCR's McClintock



from your audience your operating costs." (See special report in this issue for more.)

Spy Shops Raided

■ Watch out, 007! U.S. Customs agents recently participated in a nationwide crackdown of stores selling illegal electronic eavesdropping and bugging devices. The 24-city sweep netted such goodies as pens with microphones inside, clock and light switch bugs, and artificial plants with mikes and recorders attached.

All are violations of the Electronic Communications Privacy Act of 1986, which prohibits any device that covertly intercepts wire, oral, or electronic transmissions.

Illinois State Police Master Sergeant Dywane Hill, operations officer for ISP Enforcement Command's Technical Investigations Section said that "we believe electronic eavesdropping to be very intrusive, and while the court order route is at times frustrating, it is the only way to ensure that the power to do this is not abused. When you find out that any private detective can for \$25 go out and buy these same types of things, the real frustration sets in."

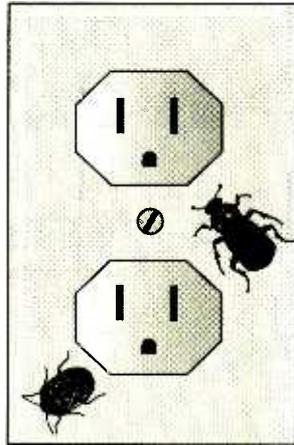
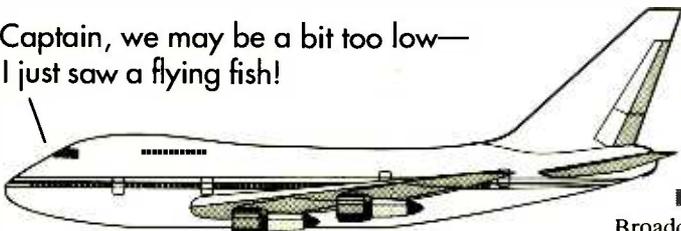
Ground Control to Major Tom

■ Air traffic controllers working a United Airlines jet over the North Atlantic lost contact with the aircraft after it dipped below radio coverage. The Boeing 767 had lost power to one of its two engines and turned to an emergency course toward Bermuda.

When the aircraft lost altitude due to the engine failure, controllers were unable to communicate with it for stretches of eight to ten minutes at a time. According to the controllers, the antiquated long distance radios do not receive or transmit well with aircraft flying at low altitudes. United says that the plane's flight crew was in constant contact with company operations via a satellite link.

Flight 987 was nonstop from Kennedy International to Sao Paulo, Brazil, with 111

Captain, we may be a bit too low—
I just saw a flying fish!



souls aboard. After dumping green fuel, the aircraft landed safely at Bermuda.

GMRS Delicensing

■ The FCC is again knocking on the door to Congress, asking that personal radio services be delicensed. The US House of Representatives is currently considering HR 963, a bill that would authorize the FCC to drop license requirements for personal radio services such as GMRS. The FCC has announced that is about to

adopt a Notice of Proposed Rulemaking to delicense a portion of the GMRS band in order to create a "very short range" personal radio service."

The NPRM cannot be created unless and until Congress authorizes the move. The Personal Radio Steering Group is urging us all to write Congress to oppose the change and protect GMRS for personal and family use.

Mayday, Mayday . . .



April Fool

■ The FCC's Tampa, Florida, Field Office used close-in direction finding techniques to track down a hoax caller transmitting false distress calls in early April. Coast Guard St. Petersburg reported receiving calls for help on Marine Channel 16 and notified the FCC, who homed in on a 12-year-old boy calling from his father's boat on a trailer in their yard. The radio was unlicensed, which may subject the owner to addition fines and possible jail time, on top of the maximum possible penalty for transmitting false distress calls, which is six years imprisonment, a \$5,000 fine and liability for all costs incurred by the Coast Guard which are related to the incident.

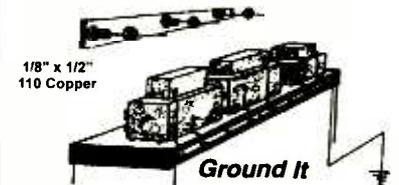
Wooing the People

■ India's Information and Broadcasting Ministry is setting

up a network of transmitters in the Kashmir valley and Jammu intended to cover the entire border with Pakistan. The transmitters are intended not to "woo the people" but to counter Pakistani broadcasting, which India claims is propaganda aimed at "the lonely sentinels of our borders." At least a dozen transmitters will be installed, most of them low-powered with a range of up to six kilometers.

"Communications" is written by Larry Miller with help from Laura Quarantiello, Rachel Baughn, and the following readers who are members of the Communications Media Monitoring Team: Harry Baughn, Brasstown, NC; George Beard, Kansas City, KS; Kevin F. Berrien, Chicopee, MA; Roger Cravens, England; Jeff Helgoe, Illinois; Steve Kaatz, Huntington Woods, MI; Bob Madorin, Lenexa, KS; Richard Sklar, Seattle, WA; Keith Russell, Kansas City, MO; David Wright, Oceanside, CA, and MT's own George Zeller, Cleveland, OH. We also consulted the following publications and we list their names in appreciation: *BBC World Broadcast Information*, *National Scanning*, *Personal Radio Steering Group* and *W5YI Report*.

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See CQ Amateur Radio Magazine February 1994, Pg. 66, Antennas And Accessories J. Martin "Ground It" Bus

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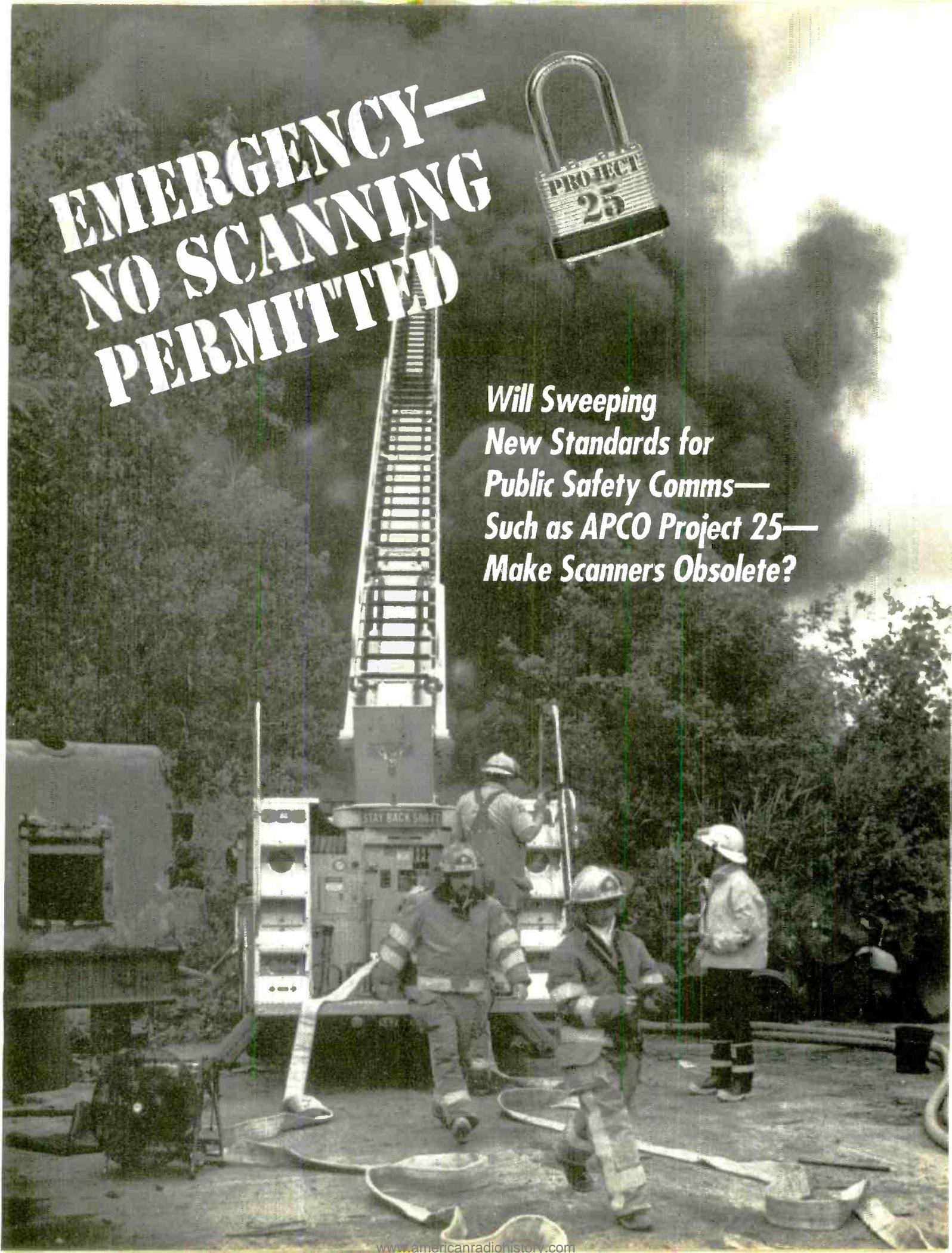
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*Will Sweeping
New Standards for
Public Safety Comms—
Such as APCO Project 25—
Make Scanners Obsolete?*



Project 25 is set to take public-safety VHF/UHF communications into the next century with narrowband digital modulation and unprecedented interoperability. Will these standards mean the end of scanning as we know it?

By Kirk Kleinschmidt, NTOZ

Every 20 years or so, advances in radio and telecommunications technologies sweep across the landscape, changing the way public-safety agencies communicate. These changes increase the scope and type of possible comms—and they turn the monitoring hobby on its ear in the process!

If “listening in” technology trickles down to hobbyists, technology improvements are good for “business.” After all, to stay in the game, you need up-to-date radios and accessories. Equipment sales go up, companies remain healthy, newcomers join the ranks, etc (I’ll see your computer interface and raise you a CTCSS decoder?). However, if technology leapfrogs hobbyists, the future is uncertain. As of 1995, the future of hobby scanning is uncertain....

The culprit lurking just around the technology corner this time is digital radio, the very mention of which has been known to strike fear into the hearts of die-hard monitors!

Digital radio has been sneaking up on us for at least a decade, always in the back of our minds. Several manufacturers produce 800-MHz trunked systems with proprietary data encryption, second-generation digital cellular telephone service is up and running in many larger cities, and even rural law-enforcement agencies have encrypted data terminals in their squad cars.

Progress to date on the digital front, however, has been incremental, and there’s still lots of stuff “in the clear,” even if some of the juicier catches have become *braaaaaps* and *bluuuurps* to our analog FM ears.

With APCO 25, the switch to digital radio systems is almost set in stone. It’s not a question of whether the switch will take place, it’s mostly a question of when things will start and how fast they will happen.

Accelerating the process is a set of standards that every manufacturer (or most manufacturers) will adopt, eliminating the hit or miss approach of producing proprietary, incompatible systems.

Simply stated, APCO 25, the “mother of all public-service radio standards,” stands a very good chance of revolutionizing VHF/UHF public-safety communications (plus amateur radio) in this country, and perhaps worldwide.

APCO 25, known by most contributors as simply Project 25, is a hot topic among government and industry players, and

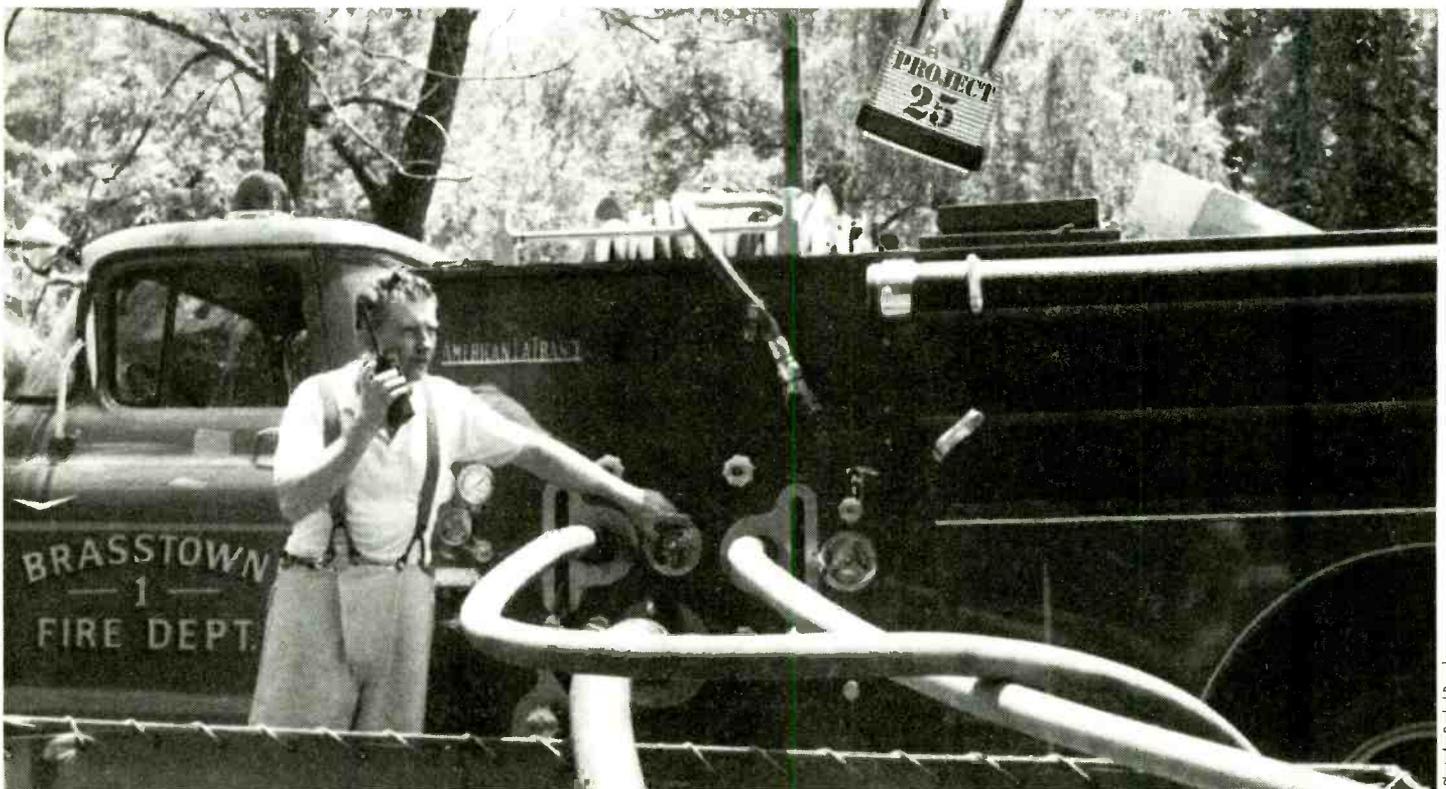


Photo by Rachel Baughin

five interim government standards have already been published for consideration, review and comment in the Federal Register. As this article went to press, the International Telecommunication Union in Geneva expressed interest and support for Project 25.

This article takes a look at Project 25 and what it may mean for public-safety agencies and uncounted thousands of scanner hobbyists.

■ Project 25

Describing a complex project simply, Project 25 is a joint federal/state/local effort to set common technical standards (a suite of standards) for VHF/UHF radio systems, handheld and base, among all public-safety communicators (including federal agencies and the military).

Project 25-conforming radios will use up-to-date digital modulation to reduce bandwidth, increase communications range and provide for several levels of digital security and layered interoperability among service providers (while providing backward compatibility with analog FM systems).

Imagine if police, fire, amateur radio, county, state and federal communicators could talk to one another without the hassle of today's largely incompatible radio systems. That's Project 25's goal.

As the standard is implemented, public-safety comm bandwidths will shrink from today's 25 kHz (analog FM), to 12.5 kHz (first-generation Project 25 digital voice systems), to an eventual 6.25 kHz (second-generation Project 25 digital)—a 4:1 gain in spectrum efficiency.

Manufacturers will gain in "efficiency"



Photo courtesy of Motorola

as well. Today's VHF/UHF communicators must choose from a hodgepodge of products and comm systems provided by many discrete manufacturers. Radios from one manufacturer aren't compatible with those of another. If you're a government agency or a municipal police department, you buy Ericsson gear, and stay with Ericsson gear. Buy Motorola, stay with Motorola. Buy E.F. Johnson, stay with E.F. Johnson. And if your present system doesn't suit your agency's needs, you're locked in because of incompatibility.

Project 25, in setting common standards, will allow every manufacturer to produce compatible radios, increasing competition and

bringing down prices. According to Steve Nichols, general manager of BK Radio (Bendix King), an emerging Project 25 manufacturer. "When similar standards were set for America's cellular telephone industry, competition and product availability exploded and prices fell dramatically. A similar scenario is envisioned for public-safety communicators."

■ APCO History

APCO, the Association of Public-Safety Communications Officials, International—a major proponent of Project 25—was founded in the 1930s as the Association of Police Communications Officers. The group's early work included the popular 10-codes used for decades by law enforcement agencies to streamline radio comms. Recently, APCO's Project 16, "800-MHz Public Safety Trunking Recommendation," helped usher in the present era of more flexible, trunked public safety radio systems. APCO is designated by the FCC as the frequency coordinator for the Police Radio Service.

Project 25, the first standard-setting effort encompassing so many levels of government and public safety users, got underway in 1989. What's also interesting is that Project 25 is user-driven, not manufacturer driven. Under the old system, manufacturers developed technology and sold it to users. Project 25, tapping its many contributors and a wide experience base, evaluated existing technology, incorporated emerging technologies and set standards to be matched by multiple manufactur-

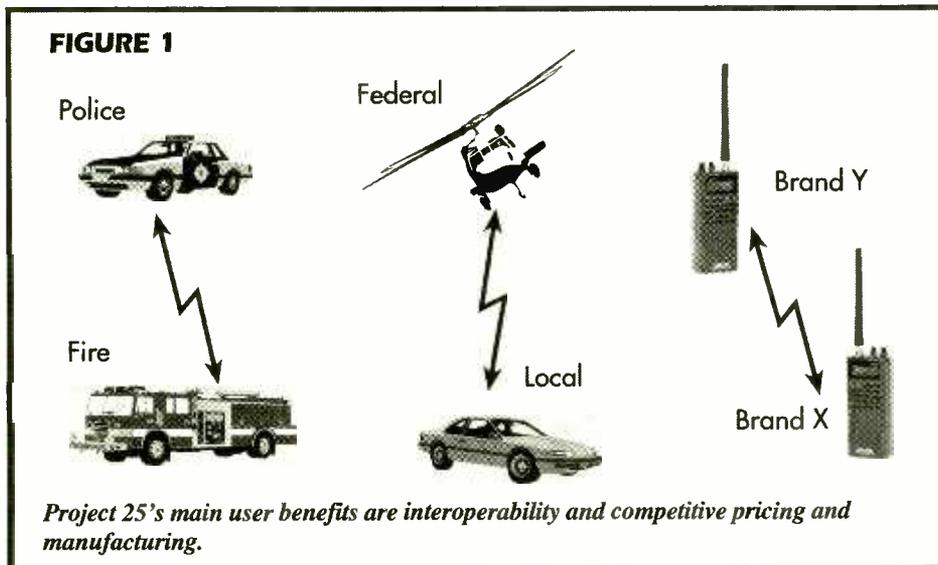
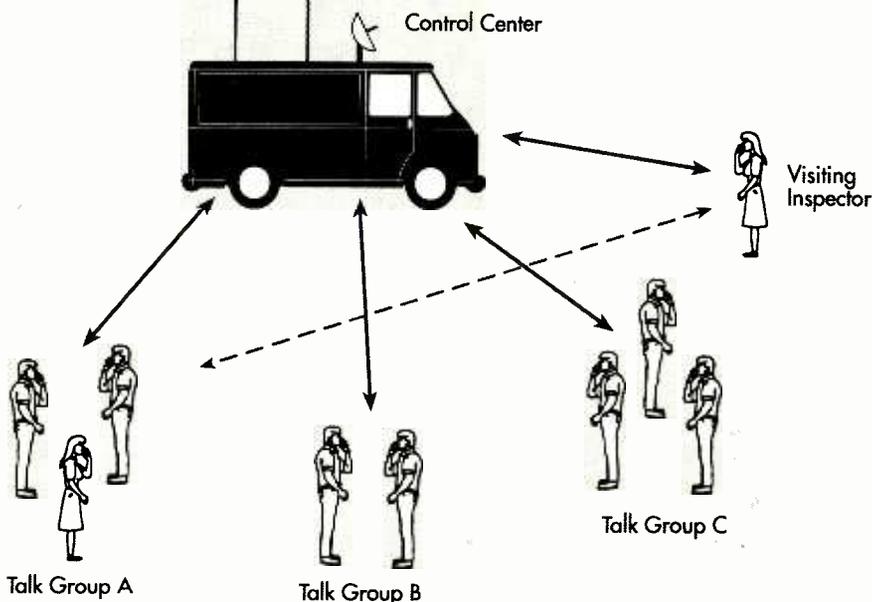


FIGURE 2



Because each Project 25 radio has its own digital address (like an ID number), “talk group” operation is built in. Here’s one way it works: Let’s say that there are several accident investigators in each talk group (team) depicted above as A, B, and C, plus one visiting federal inspector. Normally, when a member of talk group A keys his radio, only those investigators in group A will hear his transmission (even though there may be other traffic being passed on the same FDMA “channels”). To talk to the control center, the investigator in talk group A need only switch to the control center’s “channel” on his hand-held. If he wanted to talk to the visiting federal inspector—and no one else—he could key in the inspector’s “address” (or switch to the inspector’s “channel”)—communicating directly or via the control center’s repeater. For emergencies, the investigator could switch to the “emergency channel,” which would allow his transmission to be heard on everyone’s hand-held. Remember: with FDMA systems, everyone uses the same “frequency pool”—it’s the addresses and specific “channel” allocations that are dynamically allocated.

ers. APCO joined in standard-setting efforts with the National Association of State Telecommunications Directors and the Federal Telecommunication Standards Committee.

■ General Project 25 Radio Features

Compared to even the most sophisticated analog FM systems used today, radios conforming to Project 25 standards still seem somewhat futuristic. Project 25-compatible radios must:

- provide voice quality equal or greater to that of conventional analog FM systems.
- provide data-transmission capability (and data interfaces) with quality equal or greater than that of conventional analog FM systems.
- provide greater spectral efficiency compared to current systems. Trunked systems, presently used by thousands of public-safety and commercial users, use a control channel

(a data link) to assign frequencies dynamically, on demand, for digitized data and voice transmissions. This allows for greater frequency re-use and spectrum efficiency.

- accommodate standard data-encryption methods.
- offer range/power and signal-to-noise performance equal or greater than those of existing FM systems.
- be suitable for repeater or mobile-relay operation.
- conform to APCO Project 16 trunking requirements.
- be standardized to ensure wide interoperability, conventional and trunked, with a common encryption algorithm and over-the-air-rekeying (OTAR).
- be produceable by many manufacturers to ensure competitive purchasing.
- be designed with open system architec-

ture to accommodate future system enhancements (including the shift to a 6.25-kHz signal bandwidth).

- be backward compatible with conventional analog FM radios; dual-mode equipment being desirable.
- be physically similar in size to existing hand-held and base-station FM radios.
- be priced competitively.

The list of features is impressive, and if Project 25 gear can be built and sold at present-day prices (about \$800-\$2800 for a full-featured public-safety hand-held), it will likely be an even hotter prospect for wide acceptance by served agencies.

■ System and User Features

The full Project 25 system encompasses at least six system interfaces, including remote data gateways, access to the telephone network, network management, and multi-layered voice and data encryption systems. Some of the features and systems are still being ironed out. This introductory article will highlight only a few of Project 25’s systems and features.

Project 25 radios will use a digital modulation system similar to that being tested in second-generation cellular phone systems in the US and other countries around the world. The frequency-division-multiple-access (FDMA) modulation system transmits and receives voice data that has been digitized by the radio’s VOCODER (voice digitizer, or voice coder). On the receiving end, the digital information is converted back to analog speech.

Because the FDMA system is digital, voice can be transmitted simultaneously with underlying data (for example, every time an officer keys his or her radio, data from a “wearable” GPS satellite navigation receiver could ride along, giving the officer’s dispatch center a real-time update of the officer’s position) and various software or digital-signal-processing (DSP) manipulations, including multilayered data-encryption, can be performed in real-time, with no loss of audio quality. (Project 25’s aggregate data rate is 9600 bits.)

Some government Project 25 radios would incorporate “almost impossible to break” data-protection algorithms, while public-safety Project 25 radios would implement less-stringent encryption methods (or no encryption at all, which would pave the way for Project 25-compatible scanners!). The radios would be fully interoperable, except for the data encryption software or firmware (government radios would be interoperable with public-



Photo by Bob Grove

safety radios when each was using the less-stringent data protection scheme).

Al Crawley, Department of Defense Division Chief for RF Communications, says military radio users are looking forward to standardized gear: "For once we won't have to use 10,000 specially-made radios! And all that achieved through standards that will dramatically reduce costs, increase security, and allow many manufacturers to compete."

Another interesting feature of Project 25 radios is "talk group" operation. Each radio would have its own digital "address," which

allows users to take full advantage of the FDMA transmission system. Two or more addresses could be assigned to a talk group, and although hundreds of users might be using an agency's frequencies, only radios assigned to the group would receive calls addressed to a particular group.

Want to talk to only one other user among hundreds? Key in your recipient's address and only his or her radio will hear your call. Unique addressing, changeable on the fly through computer or user control, makes Project 25 radios much more flexible than

present systems.

Because of Project 25's digital packet data structure, users don't have to "hear" the data burst at the beginning of a transmission to join a talk group. Unlike many existing error-correction techniques, the Project 25 protocol provides for "late entry."

■ Manufacturers and Time Frames

Although some Project 25 details and systems need to be worked out and finalized, several manufacturers are already producing working "Project 25-like" hand-helds using off-the-shelf components.

Motorola, which holds many of the patents required for Project 25-compatible radio systems, has been producing proprietary "big bucks" versions of similar radios for several years, selling them mostly to the government. It stands to gain handsomely in equipment sales and licensing royalties.

"We're currently working on our first Project 25 radios," said BK Radio General Manager Steve Nichols. "We are licensing technology as necessary from Motorola and other manufacturers." Several other manufacturers have followed suit, and three or four have actually demonstrated prototype radios.

Shepherding standards through the government-approval process can be a tricky prospect, but most experts agree that Project 25 could be implemented by as early as 1996 to 1998.

At press time, the government comment period had just closed on the five proposed



Photo courtesy of the Philadelphia Fire Department

TETRA: European Digital Radio Standards

Spearheaded by the European Telecommunications Standards Institute, TETRA (the Trans European Trunked RAdio system) is Europe's Project 25 counterpart. Its objectives are similar, although its design is optimized for a more densely populated environment.

Here is a partial list of TETRA's design goals:

- to offer increased spectrum efficiency in land mobile networks.
- to offer increased voice quality and provide for data encryption.
- to provide users with wide ranging, flexible services for voice and data communications, and access to public fixed networks (PSTN, PDN, ISDN, etc).
- to use state-of-the-art equipment to provide savings in weight, power consumption and cost.

TETRA and Project 25 share many common denominators.

These, and several major differences, are contrasted in the following partial Project 25/TETRA feature comparison.

TABLE 1
TETRA/Project 25 Partial Feature Comparison

Feature	TETRA	Project 25
Frequency bands	380-933 MHz (approx)	150-950 MHz (approx)
RF carrier spacing	25 kHz (4-slot TDMA)	12.5 and 6.25 kHz
Max base station ERP	25 W	350 W
Mobile station ERP		
Mobile	10 W peak	10-110 W peak
hand-held	1 W peak	1-5 W peak
Cell radius		
suburban	3.8 km	7.6 km
rural	17.5 km	35 km
Modulation method	TDMA	FDMA

Project 25 interim standards, and the standards had just been formally introduced to the international community in Geneva. Whether the international angle will have an effect on possible domestic implementation has yet to be determined.

■ Project 25-Compatible Scanners?

To date, scanner manufacturers have not been directly involved in Project 25, and most are simply keeping a low-key "corporate eye" on the situation. The biggest variables for scanner producers seem to be the precise timetable for adoption of Project 25, and the question of data encryption—how prevalent will data encryption be among Project 25 users?

Sergeant John Powell, WB6SDS, past APCO president and a member of the Project

25 Steering Committee, thinks Project 25 will have a big impact on scanner users, one way or another:

"If data encryption is expensive for public-safety agencies to implement, there will be many local users that will transmit 'in the clear,' that is, they'll use only Project 25 digital protocols without an extra layer of encryption. If that happens, there could be a big market for Project 25-compatible scanners."

If encryption software becomes inexpensive, many more agencies could take advantage of it, making a Project 25 scanner relatively ineffective. Don Speights, a senior staffer at NTIA, says that even if data encryption isn't all that expensive, many agencies may choose not to encrypt routine communications because of the administrative overhead involved.

"Encryption schemes and codes have to be managed," says Speights, "even when radio systems such as Project 25 make encryption easy. Even if the cost of purchasing and managing encryption is only \$50 per radio per year, that adds up quickly, especially if your agency has a thousand radios."

Powell says many agencies may choose to encrypt only the most sensitive comms, much like many larger agencies do now using existing proprietary digital radio systems. That would leave the bulk of the digital comms available to owners of Project 25 scanners.

In addition to the encryption aspect, whether manufacturers eventually produce Project 25 scanners depends on how much it costs to license the "intellectual property rights" necessary to legally produce Project 25 hardware. These fees have not been determined, and expectations range from reasonable to prohibitive.

"Scanner manufacturers will have to license the technology," says Powell, "which could be expensive." Speights agrees, and urges potential manufacturers to join the project as early as possible, noting that the major players are already onboard.

Robert Miller, AA5FL, Radio Shack's VP of merchandising procurement and development, says that although his company is aware of Project 25 and is "keeping tabs on it," he says the scanner marketing giant "will do whatever it takes to produce an above-board, legal Project 25 scanner"—if the marketplace demands one.

Miller also sees potential political issues looming: "The sweeping nature of Project 25

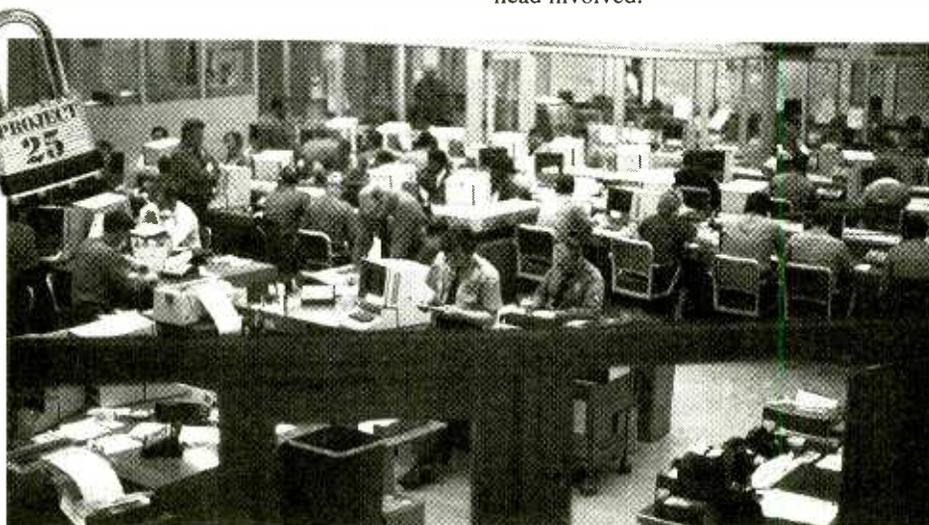


Photo courtesy of Motorola

may force the public to pressure the government to back down on the encryption issue. After all, the public may demand access to routine public-safety comms if for no other reason than to hear how its tax dollars are being spent."

So how long might we have before digital scanning becomes an issue in our in-home listening posts?

Powell, a sergeant with the University of California, Berkeley, police department, expects agency budgeting to affect the phase-in process: "Realistically, I think Project 25 will be phased in over the next five to ten years. There are a few bumps in the road, but increased congressional pressure for interoperability and cost savings will likely ensure the project's survival."

■ Thanks

In addition to those quoted in this article, I'd like to thank the helpful folks at APCO (2040 S Ridgewood Ave, South Daytona, FL; tel 904-322-2500) for faxing me reams of documents.

Special thanks go to Bob Fenichel, WA2TMT, and John Powell, WB6SDS, for reviewing this article for accuracy and for spending their valuable time on the telephone



Photo courtesy of CF

helping me through basic and esoteric "Project 25-speak."

Ham Radio and Project 25

Project 25 standards, if applied to Amateur Radio, could really add "spice" and welcome spectrum efficiency to today's popular VHF/UHF bands. And it's a given that almost every feature enjoyed by public-safety users could be enjoyed by ham operators (data encryption is unlikely, though!).

Robert Fenichel, WA2TMT, a member of the Project 25 steering committee and chairman of the Federal Telecommunication Standards Committee, Land Mobile Radio Subcommittee, sees Project 25 migrating to Amateur Radio sooner or later:

"Project 25's digital nature [talk-group operation versus analog tone squelch, for example] makes it ideal for future Amateur Radio applications. There are issues, however, namely cost, initially, and certain technology questions. Project 25 also requires powerful DSP processors."

BK Radio General Manager Steve Nichols sees the migration happening from the top down. "Hams tend to be early adopters of new technology, and many hams are employed by government agencies and commercial concerns that will be using the new Project 25 technology as soon as it hits the streets. When

they get their hands on it at work, they'll probably want to use it in their ham radio pursuits."

DoD Chief Al Crawley sees the adoption of Project 25, or something like it, as inevitable. "Digitized voice and data will happen in amateur radio. It's only a matter of time. These digital systems offer improved voice quality, increased error-handling capability (which can increase communications range) and far greater spectrum efficiency."

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AIR BOSS

CONTROL TOWER ON WHEELS



The crowd enjoys the USAF Thunderbirds while Cheffins keeps things flowing smoothly. From the variety of antennas surrounding the announcer's position, it's clear that the tower is prepared for communications in almost any band.

By Patrick M. Griffith, NONNK

At a recent air show at the Jefferson County Airport in Broomfield, Colorado, I became intrigued by the mobile control tower and announcer platform parked near the runways. Listening to the air traffic operations on several frequencies with my portable scanner, I also noticed that instead of the normal communications with "Jeffco Tower" all aircraft were being controlled by someone called "Air Boss."

Utilizing the power vested in me by my media pass, I was not only able to find out more about this unique vehicle, but I was also quickly ushered inside it for the grand tour. What I found out was very surprising.

Instead of being operated by the FAA or some other government agency, as I had originally suspected, it turns out that this control tower on wheels is a privately-owned enterprise that supplies air traffic control services and public address facilities for the announcers

at air shows such as this one. The vehicle is owned by G-M Productions of Murfreesboro, Tennessee. It is lavishly equipped with a host of electronics for communications and public address operations, and was custom designed for this particular purpose.

The vehicle is built on a 26-foot, dual axle, fifth wheel trailer chassis, and is towed throughout the country by a specially-equipped, high power, pickup truck. It is equipped with a 12-foot by 8-foot control tower cab allowing 360 degree visibility.

The tower cab is equipped with three Terra Avionics 720-channel VHF AM aircraft communications transceivers, with 5 watts output power and a frequency range of 118.0 to 135.975 MHz. For communications in the UHF military aircraft band, it utilizes a Magnavox AN/ARC-164[V] UHF AM transceiver with 10 watts output power and a frequency range of 225.0 to 399.975 MHz. Additionally, the vehicle carries a number of programmable VHF and UHF FM

handheld radios, which provide the crews with ground support communications and allows them to communicate with local authorities. Other equipment in the tower includes a signal light gun, a cellular telephone, and wind speed and direction indicators.

Built in to the vehicle is also an impressive, high power audio system which allows a master of ceremonies to narrate an event, provide music or recordings from a myriad of sources, conduct celebrity interviews, and perform VIP introductions to spectators at distances of up to 5,000 feet from the announcer platform.

The air show controller operating this vehicle is Bob Cheffins, a.k.a. "Air Boss." Bob is an FAA-certified control tower operator with over 34 years of experience in air traffic control, airport management, and air show operations, including 20 years as an air traffic controller in the U.S. Air Force.

Between his busy duties as air show controller, Cheffins was able to fill me in on the tower's operations. He told me that he and the mobile tower travel for several months out of the year providing their services at many air shows throughout the country. When an air show is in operation, the local control tower closes the air space around the airport to all operations except those directly involved with the air show itself. They then turn control of the area around the airport over to Cheffins, who commands all aircraft operations on the ground and in the air.

The frequencies used vary from show to show, depending on local availability and requirements. That is the reason for the wide-band, multi-channel communications equipment. At the particular show that I attended, primary air operations were on 123.975 MHz and backup was on 126.0 MHz with some military aircraft communicating on 388.0 MHz.

Many other air and business channels were also very active during the show, as were the frequencies of support agencies such as local police, fire, and EMS units. Air Boss does have a few "dedicated" frequencies, including 169.505 MHz for the sound system's wireless microphones and 469.500 and 569.550 MHz for "ground to ground" operations of the support and operations staff. All of these are low power and will probably only be received in the immediate vicinity of the mobile tower.

As I looked around at the other viewers at the air show, I couldn't



"Air Boss" Bob Cheffins talks a United 737 through a low flyby at the end of the show.

help but think about how much they were missing by not being able to hear *all* of the action. The next time there is an air show in your area, be sure to take your scanner along, and look for the "Air Boss" and his travelling control tower. Then tune them in on your scanner for some real behind-the-scenes excitement.



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10am-5pm Exhibits and Listening Post
12-4 pm Special interest groups
1-2 pm Scanning Atlanta - Roger Cravens
2-4 pm International Broadcaster's Forum
7-7:30pm Opening ceremony
7:30-8:30pm MT Expert panel/
Rachel Baughn, host
8:45-9:45pm ST Expert Panel /
Larry Van Horn, host

Saturday, October 14, 1995

9-11:15am Seminars
9am Exhibits Open
11:15am-1pm Lunch
3pm Exhibits Close
1-4:15pm Seminars
4:30pm Bug Hunt (outdoors)
5:15pm Prize drawing
7pm Banquet, followed by
Post-Banquet Bug Hunt

Sunday, October 15, 1995

9am-1:45 pm Seminars

Pre-Registration Form

- Enclosed is my \$55 registration fee
 Enclosed is my \$23.95 Banquet fee



Name _____

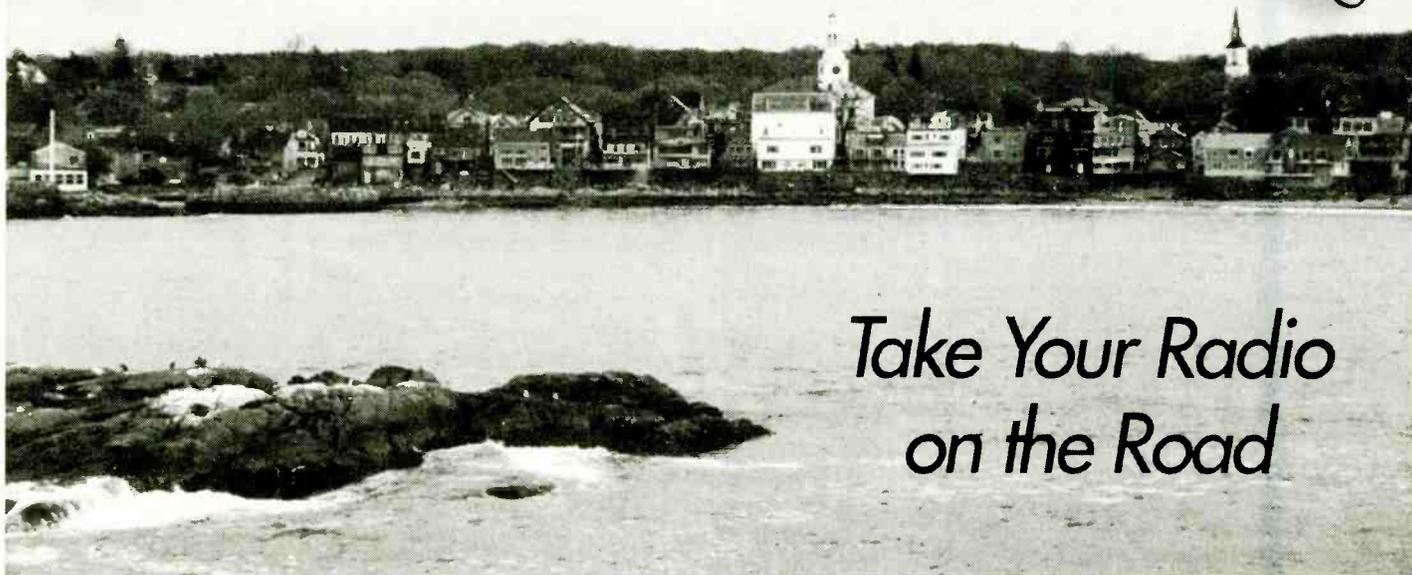
Address _____

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Mediumwave Mini-DXpeditions



Take Your Radio on the Road

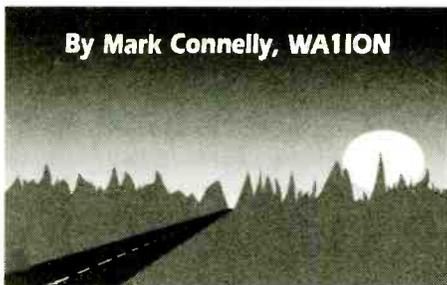
A seaside location is ideal, especially for reception of distant mediumwave stations (DXing). The Granite Pier site in Rockport, Massachusetts, is one of the best Boston-area locations for medium-wave reception of stations from Brazil, Africa, Europe, and the Middle East.

The "DXpedition" is often thought of as an activity reserved for amateur radio operators who head for the boonies or a remote island in search of an interference-free environment and one more logging on the books. Not so. Shortwave and mediumwave listening enthusiasts have also launched large-scale DXpeditions, often involving several experienced hobbyists, miles of wire, numerous receivers, and around-the-clock activities running for a weekend or longer. These are the grand efforts of which DX legend is made.

Our focus in this article is going to be on mediumwave DXpeditions. You can find accounts of some of the more ambitious of these written up, along with valuable guidance, in Shawn Axelrod's *DXpedition Handbook* and by Nick Hall-Patch's compendium in *Proceedings 1990*, among other places. (See the sidebar for references and resources.)

Mini-DXpeditions, on the other hand, are smaller-scale efforts not usually requiring an overnight stay nor more than two operators. These shorter efforts can still be quite rewarding. Some of us have discovered worthwhile listening locations not far from our homes or workplaces. Just getting a bit farther from

By Mark Connelly, WA1ION



"Mini-DXpeditions are smaller-scale efforts not usually requiring an overnight stay nor more than two operators. These shorter efforts can still be quite rewarding. Some of us have discovered worthwhile listening locations not far from our homes or workplaces. Just getting a bit farther from pesty local stations or noisy power lines can help DXing in any band."

pesty local stations or noisy power lines can help DXing in any band.

Other physical and geographical considerations which can improve signal strengths are locations having a view of the horizon not blocked by buildings, mountains, and other obstructions; seaside locations for DXing medium and low frequencies because of both the high ground conductivity and a clear horizon; mountaintop sites, especially for HF, VHF, and above; and flat, open farmland and lakeshores.

The simplest DXpedition for mediumwave can be taking some loggings on the car radio for an hour or so while parked at an advantageous site. Drivetime loggings (for example, logged by "Marc DeLorenzo in the Hyundai") appear regularly in DX magazines because of the difficulty of DXing from RF-noise-riddled urban apartments with no space for outdoor antennas.

Besides your car radio (with an accurate clock), the only other equipment you might need on the simplest mediumwave mini-DXpedition is a logbook, reference materials, a pen, and a flashlight. Car radios are usually quite sensitive. The newer, synthe-

Mediumwave Resource List

1. For a full list of publications and reprints, including *DXpedition Handbook*, MWT, APT, RTU-1, RTL-2, DCP-1, MWT-3, and MWDX-5 referred to in this article, send First-class stamp or 1-IRC to:
 - National Radio Club: Ken Chatterton, P.O. Box 164, Mannsville, NY 13661-0164.
 - International Radio Club of America: Steve Ratzlaff, 1885 E. Bayshore Rd, Space 90, East Palo Alto, CA 94303.(For sample issues of both clubs' bulletins, see addresses in MT's "Club Circuit.." Some reprints and technical help available from author by e-mail at markwa1ion@aol.com)
2. *Proceedings 1990*; contact John Bryant, Fine Tuning, RRT #5 Box 14, Stillwater, OK 74044
3. Quantum loop: Gerry Thomas, 3635 Chastain Way, Pensacola, FL 32504
4. RSM-105 loop: Ray Moore, 904 S. Jade Drive, Key Largo, FL 33037

sizer-tuned models have the advantage of accurate frequency readout. However, some are channelized radios which can make tuning in foreign "split" stations more difficult. European and African stations, for example, will be heard in between US channels, because, in the mediumwave band, stations in the eastern hemisphere use 9 kHz channel spacing, whereas we in the western hemisphere use 10 kHz.

Some car radios are also harder to tune to weak station frequencies because of the way their scanning functions. Still, for many broadcast band DXers, the car radio will be the receiver of choice.

Unlike a full-blown DXpedition requiring a substantial expenditure and time away from work and home duties, a mini-DXpedition can be "squeezed in" between leaving work and having dinner, or between dinner and bedtime. Sometimes these outings can be very impromptu, based upon hearing something unusual during a homeward commute. More than once, when I worked in downtown Boston, the sound of loud African heterodynes on the car radio around 5 pm EST (2200 UTC) in winter made me detour to the waterfront for an hour or so of listening before heading home.

■ Beyond the Car Antenna ...

The next step up from car radios on mini-DXpeditions is the portable receiver. Inside of a parked vehicle, however, a portable receiver will only get powerhouse locals. The metal vehicle surrounding the receiver eliminates everything else.

Few portable radios are sensitive enough on their built-in antennas even when operated outdoors, let alone inside a car. An external antenna, therefore, is necessary. The whip antenna that connects to the car radio is a high-selectivity (Q) source that will not operate properly into the low-impedance external antenna inputs of portable receivers. If the car whip is to be used, it must be fed to a high-gain, high-Q tunable amplifier with an input impedance similar to the high impedance of the car radio. Such an amplifier would have a low-impedance (50 to 75 ohm typical) output. Two homebrew regenerative tuners—"Medium Wave Tuner" (MWT) and "Antenna Parallel Tuner" (APT)—are described in various National Radio Club / International Radio Club of America reprints (see sidebar).

A broadband active whip such as the MFJ 1024, powerable from the car's 12 VDC

supply or from a battery pack, could be used for fast and easy scanning in areas not having strong local stations. The whip should be roof-mounted for best results.

A tunable antenna is always preferable, in terms of signal-to-noise and overload immunity, to a broadband active antenna. Active antennas such as the MFJ 1024 can be modified for varactor-tuned operation: see the NRC / IRCA reprint about "Remote Tuning Unit-1" (RTU-1). Tuning the whip will prevent spurious responses at urban and suburban sites.

Because of their ability to null and peak different stations, and the overload immunity afforded by a high-Q tuned source, most medium-wave DXers prefer loops to any other

compact antenna. However, large air-core loops such as the Kiwa and RSM-105 are probably too cumbersome for most mini-DXpeditions. Small ferrite loops like the Quantum, SM-2, and the Radio West Loop are recommended. Though I believe the latter two are no longer in production, they can sometimes be found at hamfests and flea markets.

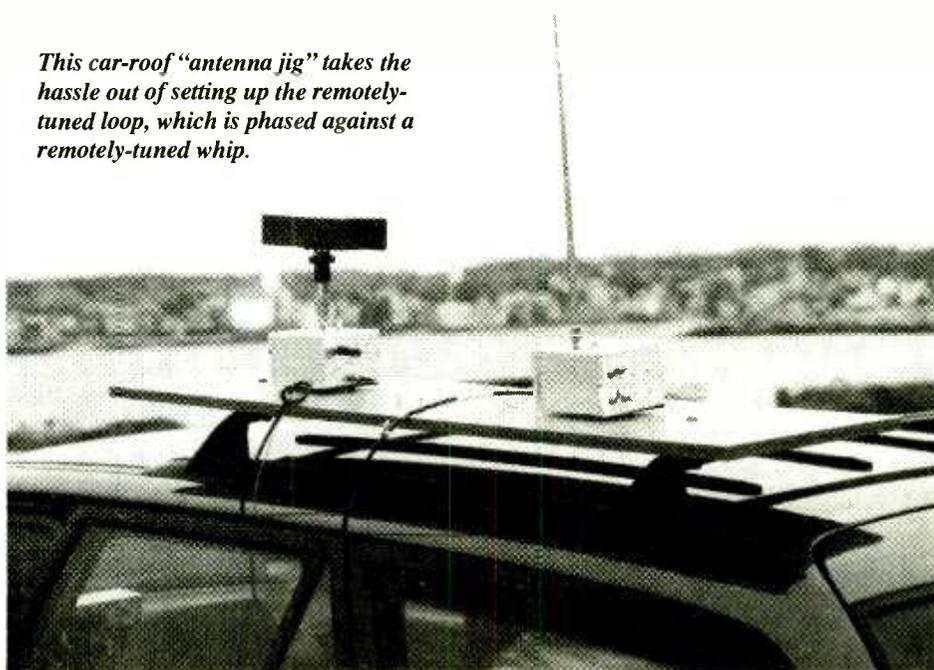
It's rather awkward to have to tune the loop—usually located on the car's roof—while you tune the receiver inside the car. If you position the loop on the roof immediately adjacent to the window, you can reach out the car window to adjust it. Or, if you only want to reach outside the car occasionally to adjust the loophead, you can build a remotely-tuned loop (ask

for RTL-2 reprint).

I advise you to find a way to mount the loop base securely to the edge of the roof. More than once, a ferrite loop has been dislodged from a car roof by a gust of wind, especially at a beach site. This can be hazardous to your loop's health and to your sanity! Take a plastic bag to cover loops and active whips during rain; a rigid plastic radome-like cover might be even better.

Especially if you encounter a strong signal which blocks reception of weaker stations, more than one loop, or a loop in combination with a whip, can be used together to null out the interfering signal. Such phasing is addressed in detail in the RTL-2 and DCP-1 (Dual Controller Phaser) articles.

This car-roof "antenna jig" takes the hassle out of setting up the remotely-tuned loop, which is phased against a remotely-tuned whip.





"On the subject of receivers, there are many portables which will perform very well when operated with a good loop or tuned active whip. I have used the Sony ICF-2010 (2001D), the Realistic DX-440 (Sangean ATS-803A), and the Realistic DX-392 (Sangean ATS-818CS) with good results. My Sony has the edge in selectivity over the others because it was modified for narrower filters."

■ Getting Wired

Up to now, I've been talking about antennas which can be mounted on the vehicle. Sometimes, longwires can be put up at a mini-DXpedition site. These, too, can be phased for more directivity and run through tunable preamplifiers for higher gain and sharper tuning. Installation of such wires can produce different—sometimes better—DX than can be heard using car-mounted loops and active whips.

One drawback of wires is that they must be rolled up at the end of the DXing session. Another disadvantage is that if your site has substantial pedestrian, bicycle, or vehicular traffic, your wires may be pulled up by someone (accidentally or on purpose). Wires also can attract the attention of police or can be a safety hazard. Antennas mounted on a vehicle do not slow you down when some circumstance—bad weather, police, bears, gangs of hooligans, or whatever—demands that you get away from the site quickly.

These are all factors to consider before stringing out Beverages at a site whose potential dangers are not fully known. Here in the urbanized Northeast, few mini-DXpedition sites have enough room for big antennas, anyway. You'll run into buildings, water, fences, other cars, powerlines, roads, or something else within a relatively short distance at most desirable shore sites.

I find that two insulated stranded wires of about 40 m / 130 ft. each, run at a right angle to each other and fed through an amplified phasing unit, give good results and can be rolled in quickly when it's time to leave. Still, if you're in the busy parking lot of a beach or seaside restaurant, forget the wires.

■ Beyond the Car Radio ...

On the subject of receivers, there are many portables which will perform very well when

operated with a good loop or tuned active whip. I have used the Sony ICF-2010 (2001D), the Realistic DX-440 (Sangean ATS-803A), and the Realistic DX-392 (Sangean ATS-818CS) with good results. My Sony has the edge in selectivity over the others because it was modified (by Gerry Thomas) for narrower filters. A regenerative loop (such as Kiwa's in the US or, in Europe, Martens-Dutch, or Graham Maynard-UK), or a regenerative preselector such as my MWT-3, can improve selectivity of a portable until it is comparable to that of a moderately-priced tabletop communications receiver.

The Realistic / Sangean models, while fairly insensitive on their built-in antennas, work like champs when hooked to a Quantum loop or to a regenerative wire / whip preselector. The DX-392 (ATS-818CS) has

the advantage of a built-in cassette deck. You'll want to tape the excellent DX coming in at a good DXpedition site, especially during a wild aurora or other unusual conditions. A tape made by jumping between a difficult mediumwave catch such as Lesotho on 1197 and its easy shortwave parallel of 5975 can make for interesting "show and tell" at the next DX get-together. It's nice to avoid dealing with a separate cassette deck, patchcords, etc. in the limited space and light of a compact car. (Unless, of course, you are fortunate enough to have a van or camper available.)

Portables often have more flimsy external antenna jacks that are prone to wearing out much sooner than the rugged BNC and UHF (SO-239) connectors typically found on higher-grade receivers. Think about modifying your portable's external antenna input connector for longer life.



Author adjusts DCP-1 phaser/controller for remotely-tuned antennas on car roof. The system produces a cardioid pickup pattern.

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“When you want to get serious, use a communications receiver that is powerable from 12 VDC. This includes the Drake, JRC, ICOM, Yaesu, Lowe, and Kenwood radios customarily used for critical DXing. Obviously you will do much better on weak stations and foreign splits by using such a receiver instead of a compromise portable. The drawbacks are increased power consumption and the added room such a receiver takes up.”

When you want to get serious, use a communications receiver that is powerable from 12 VDC. This includes the Drake, JRC, ICOM, Yaesu, Lowe, and Kenwood radios customarily used for critical DXing. Obviously you will do much better on weak stations and foreign splits by using such a receiver instead of a compromise portable. The drawbacks are increased power consumption and the added room such a receiver takes up. The new battery-operable Drake SW8 promises to bridge the performance gap between portables such as the Sony ICF-2010 and tabletop receivers such as the R8 and NRD-535.

■ Practical Advice

Start the car up about every 30 to 60 minutes if you're running receivers, preamplifiers, etc. from its battery. Run the engine for five or more minutes each time. In winter, you'll want to do this to get some heat as well as to recharge the battery! Use a separate flashlight or lantern rather than a light that draws power from the car battery. I learned this the hard way a few years ago when I "croaked" the car battery during a cold winter outing to Swampscott, MA. It took more than an hour to find someone for a jump-start. You don't want this to happen!

The sidebar has a check-list of equipment and resources, depending on how sophisticated you wish to get. Use this to do a dry run of mini-DXpeditioning from the driveway at your home location to figure out optimal placements of receivers, tapedecks, books, lanterns, antenna tuners, patchcables / antenna lead-ins,

etc. Determine the most efficient, most comfortable set-up. After all, at home, if you decide you need another book, tool, adapter, or patchcable, it's right there inside your house or apartment. If you left a necessary item at home and you're parked out on a pier more than an hour's drive away, it's "tough luck, Charlie."

It's especially important to take back-up batteries and a small back-up receiver (e. g. Realistic DX-380) if your travel time to the site from your home (or work) location is over an hour. You don't want dead batteries or a receiver malfunction to wreck the whole effort.

■ Business / Vacation Trip Mini-DXpeditions

When you have to travel by air to get to your destination, instead of driving your own car, you must be more selective in terms of items taken. This is also true if DXing is to be a spare-time pursuit rather than the focus of

the trip. The check-list can be customized accordingly. A radio, a small loop, the log-book, and the *WRTH* might be all you can pack ... Better that, than nothing at all.

For foreign travel, power adapters may be required. I recommend you carry receipts to prove where equipment was bought. Also bring magazine or newspaper articles explaining the hobby in case you have to prove that you aren't a spy or smuggler. Think about customs restrictions at both ends of your trip. Talk to those who have visited a given area. Find out what DX is like there and if there are any DXers living nearby. Learn about local laws, possibly-useful sites, and any special problems (weather, insect pests, high crime, etc.).

■ Conclusions

Really interesting DX can often be heard in just a few hours at a choice location within a reasonable drive of home. On DXpeditions to Granite Pier in Rockport, Massachusetts, and other coastal sites in New England and eastern Canada, upwards of 30 countries have been logged on medium-wave in a two- or three-hour stretch starting at sunset. Similar results have been obtained by DXers in Florida during short sessions. Brief pre-dawn operations from the Pacific Northwest have resulted in rapid-fire logs of stations from Australia, New Zealand, Japan, and many other countries.

One thing mini-DXpeditions prove is that it doesn't take a huge investment of time or money to "spice up" your DX life.



Author's DX equipment includes a Drake R8, homebrewed dual antenna phaser (DCP-1), and remote controller.

This article was first published by the National Radio Club.

Mark's Mini-DXpedition Check-List

This list is written with single- or dual-operator, car-based, medium-wave mini-DXpeditions in the US and Canada in mind. It can be adapted for operation on other bands, other locales, etc. One to five hours of actual DXing time is typical. Items that are not sensitive to heat and cold—such as tools, cables, and books—can be stored in the car on a permanent basis.

■ Bare Essentials

- portable receiver (e.g. Sony ICF-2010) with batteries and / or car cigarette lighter adapter
- ferrite loop (RTL-2 base with Quantum head; or equivalent)
- whip with BNC plug (for use of RTL-2 as active whip)
- regenerative preselector / remote loop controller (MWT-3)
- cables to connect RTL-2 to MWT-3, MWT-3 to receiver
- kit of between-series coaxial adapters (BNC, UHF, RCA, N, SMA, F, stereo & mono phone & mini-phone)
- 12 VDC power cord for loop / preselector, etc.
- logbook, hit lists
- World Radio-TV Handbook*
- NRC Domestic Log*
- flashlight or lantern
- pens, pencils
- rolls of wire (two about 40 m / 130 ft.; one or more over 250 m / 820 ft.)
- toolbox with common tools (screwdrivers, socket set, knives, cutters, pliers, wrenches, 12 V soldering pencil, solder, electrical tape, hammer, etc.)
- clock or watch set to UTC
- single lighter plug to 2 (or more) jack car power adapter
- extra batteries as deemed necessary
- clip leads (alligator, "Easy Hooks," etc.)
- rugged storage case(s) for the above items

■ Items Worth Having

- small portable cassette recorder, blank cassettes
- amplified two-wire phasing unit (e.g. MWDX-5)
- second RTL-2 loop and a DCP-1 controller for loop-vs.-loop, loop-vs.-whip cardioid pattern generation
- small back-up receiver (should also have digital readout)
- 2-meter ham transceiver, CB, or cellular phone for emergency communication

- pocket digital multimeter
- batteries, interconnecting cables (power/AF/RF) as required for the above
- headphones
- recent copies of *DX News* (sample one 1st-class stamp to NRC, Paul Swearingen, 2840 S.E. Illinois Ave, Topeka, KS 66605-1427); *DX Monitor* (sample one 1st-class stamp to IRCA, PO Box 1831, Perris, CA 92572-1831), and other hobby bulletins
- supplemental station lists (e.g., *NRC DXpedition Handbook*; *LF Beacon Guide* - Ken Stryker, 2856 G West Touhy Ave, Chicago, IL 60645)
- NRC directional pattern book
- compass
- sunrise / sunset maps or tables
- great-circle map or bearing / distance tables for the DXpedition location
- US / Canada road atlas
- world atlas
- topographical map of local area, aeronautical charts showing tower sites and beacon freq's
- Spanish / English and other language dictionaries as needed
- lunchbox with sandwiches, snacks, soda / fruit juice; thermos with coffee or tea
- bow & arrows, fishing line, thin & thick nylon rope for launching antennas into trees
- insect repellant for summer DXpeditions
- matching / noise-reducing transformers for wire antennas

■ When You Really Want to Go Nuts

- separate deep-cycle (marine-type) battery
- communications receiver (e.g., Drake R8)
- spare fuses for communications receiver
- VCR for up to 6 hours of taping DX audio or for experiments with direct taping of RF
- 12 VDC to 115 VAC converter if needed; AC extension cords / power strips / adapters
- laptop computer for checking previous logs and geographical data, and for taking notes
- ground rods, termination resistors for Beverages
- special protective clothing, boots, gloves as required for wet / rough terrain, harsh weather
- folding tables, chairs for outdoor set-ups

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Shortwave broadcasting became a hot media topic a few days after the April 19 bombing of the Alfred P.

Murrah Federal Building in Oklahoma City, as a connection was drawn between Mark Koernke and the Michigan Militia, and Timothy McVeigh. "Mark from Michigan" produces an hour-long program called *The Intelligence Report* which was broadcast every weeknight on WWCR, 5065 kHz, at 0000 UTC.

Koernke, who obviously enjoyed his notoriety, continued pounding extremist positions, such as saying that the U.S. government itself blew up the Federal Building. However, a week after the bombing, WWCR "temporarily suspended" Koernke's program. WWCR had come under intense scrutiny by the national media, and felt itself "trashed" by ABC-TV.



OKC: The Radio Aftermath

By Glenn Hauser

From WWCR's press release of 28 April: "The adverse publicity against programs of this nature in the aftermath of the Oklahoma City bombing and indiscriminate killing of innocent people including children, has caused us to reconsider our responsibility as a broadcaster... Those who use the media need to understand that their words, to paraphrase a recent editorial [by William Raspberry], 'no matter how innocent or rhetorical or satirical they may in fact be, have the power to push certain people over the edge, into violence.' We don't mean to suggest that such broadcasters should be shut-up, only to remind them that it is possible to be both conservative and responsible. It is not enough to satisfy themselves that they meant no harm. They need to reflect on the possibility that their excessive language can lead other people over whom they have no direct control, to do harm, and that their bitter words can have consequences..."

WWCR said they had no direct contact

with Koernke; his program was sponsored by Viking International Trading, Scottsdale, AZ, which merely expanded their adjacent program, *Protecting Your Wealth*, and continued with alarmist paranoia designed to promote sales of gold coins and a year's supply of food for survivalists. WWCR said little protest to Koernke's suspension had reached them, while Viking claimed to have piled up stacks of fax.

Koernke's was among the programs monitored for months by Radio For Peace International's *Far Right Radio Review*, which was widely quoted in the mainstream press. In the past Koernke had broadcast coded messages of questionable legality, such as "Jefferson wakes at midnight." Were these merely for effect, or instructions to someone? After suspension by WWCR, the program continued on some domestic outlets which specialized in super-patriot/militia formats, such as KDNO-FM in VOA's town of Delano, CA. A favorite of Michigan Militia members

is WMKT-AM, Charlevoix, Michigan, which carries militia mentor Bo Gritz.

WWCR's other "super-patriot" programming, such as Tom Valentine and the white supremacist William Cooper, continued unabated, primarily weeknights on 5065 but also scattered at other times and on other frequencies. WWCR even added another one in early May, *The Jeff Baker Report*, who shares many of Koernke's views (weeknights at 0000 and 2300 on 9475).

Baker had been fired on April 19 by WINB owner John Norris for mis-managing the station, and turning it into a right-wing talk format at the expense of evangelism. WINB had been off the air more than on with technical problems, which the engineers refused to fix as long as Baker's Main Street Media was in control. Norris hoped to have WINB back on by June; check 15715, 11950, 11790.

Ironically, April 19 was also the date when the trade paper *Radio World* published

a puff piece on the "diversity" of MSM's programming on WINB. Norris said he was planning to fire Baker for some time, and the dismissal April 19 was coincidental.

Some national stories focused on four stations: WWCR, WRNO, WINB, and WHRI; others omitted WHRI, which feels it is not in the same category, although it does carry Pastor Pete Peters and Chuck Harder. Both WWCR and WHRI, unlike WRNO, refused to broadcast overt Nazis Ernst Zündel and Kevin Alfred Strom.

From his hospital bed, Joe Costello of WRNO was unrepentant: "Pay me and it's on. But it can't be illegal and immoral."

However, almost a month after the bombing, WRNO's Saturday-night lineup of Strom's *American Dissident Voices* at 0100 UT Sunday, the Jew-hating Christian identity *Herald of Truth* at 0130, and Ernst Zündel's *Nazi Free German Voice of Freedom* at 0200 were all replaced by jazz music, as noted by Don Thornton. Strom often participates in a hate net on ham radio, 3950 kHz.

WVHA, *Prophecy Countdown's* 500-kW station in Maine, escaped media attention except for an AP story in late April by Jerry Harkavy, detailing how Greenbush residents were concerned about the new owners, who unlike the previous Christian Scientists, were refusing to pay property taxes. They were also anxious about the sect's possible connections with another Adventist splinter group, the Branch Davidians; Pastor John Osborne's "scary" preoccupation with security at the station, and how long it could hold out with stockpiled food and water; and a previous P.C. videotape, "The Military Takeover of America," featuring—Mark Koernke!

Just how large is the shortwave audience in the U.S.? It may be growing now, thanks to all the negative publicity. It was Gallup-pollled some years ago in the few-millions, but on *Communications World*, VOA Audience Research Officer Kim Elliott quoted the latest BBC research to the effect that only about 500,000 Americans listen to SW at least once a week—that's roughly one in 500 people. Radio Shack was reportedly selling out its SW receiver stock.

The two-hour memorial service in Oklahoma City the Sunday afternoon following the bombing, with some notable exceptions, was all over the radio and TV dials here in Oklahoma. But nationally, only ABC-TV carried it, while the other networks maintained their commitments to trivial ball games. We scanned shortwave during the service, and could not find it on a single U.S. station—private or VOA—which causes me to question their true piety and patriotism. However,

Kevin Hecht ran across it on the VOA Arabic service. Ironically, an Islamic cleric in Oklahoma was not allowed to participate.

■ Network Coverage

In the highly competitive Oklahoma City TV market, Newschannel 4 had recently reached first place in the ratings, but it was playing catch-up when the bombing occurred, taking an hour to get up to speed with the competition—Newsline Nine and News 5—which had live pictures of the smoke on the air in minutes. NBC, CBS, and ABC, respectively, soon had feeds from their affiliates on the air nationwide, before their own crews could arrive. OKC's only news radio station, KTOK 1000, went all-out in its coverage, at first simulcast on its normally musical FM affiliates and a statewide network. The TV stations pre-empted great gobs of network programming for a week or more, and for several days (longer on 9 and 5 than on 4), ran no commercials. Network commercial breaks were covered up by local news reports. KFOR-TV replaced Jay Leno and other NBC late-night shows with live call-ins for counseling.

■ Just All Talk?

In the wake of President Clinton's remark criticizing talk radio, various extreme right hosts clamored to take 'credit.' G. Gordon Liddy lost a few outlets for instructing people how to kill BATF agents, but despite picketing (in OKC, of all places), WKY, 930 kept him on—it's owned by the extreme-right, anti-government *Daily Oklahoman*.

For "liberal" talk radio, you really have to search. Jim Hightower celebrated his first anniversary in May on ABC Radio (which also brings you Rush Limbaugh)—Saturdays and Sundays at 12:07-3:00 pm Central Time. Before the bombing, Mike Malloy was fired by WSB 750, Atlanta, which no longer wished



George McClintock, general manager, surveys transmitters at WWCR. The station admits they do not have time to preview programs, but says, "we do rely upon our listeners to alert us when they hear offensive material."

to offer an alternative to Rush; Malloy might turn up in another major market, such as Seattle. Tom Leykis is syndicated nationwide. Gregg Dobbs is on KOA 850, Denver—also a satellite super-station—weeknights at 9:05 pm-midnight Mountain Time (often delayed for sports). Not one of them is on shortwave in the U.S. Perhaps some station ought to make an effort to put them on, just for a bit of balance.

In Oklahoma, flags stay at half-mast until July 4th.

Contributing to this report were Mike Agner, Rachel Baughn, Art Blair, John Carson, David Cole, Chet Copeland, Doug Dine, Bob Fraser, Richard Gleitz, Barbara Harris, Kevin Hecht, Malcolm Kaufman, James Latham, Wally Leisering, Diane Lévesque, LeRoy Long, Michael Martin, Diane Mauer, Allan J. Mui, John Norfolk, Ed Rausch, Bob Thomas, Don Thornton, George Thurman, Kenneth Vito Zichi, Jim Wishner; *Arizona Republic*, *Atlanta Journal-Constitution*, *Baltimore Sun*, *Boston Globe*, *Broadcasting & Cable*, *Nashville Banner*, *New York Times*, *Oklahoma Gazette*, *Oklahoma Observer*, *Patriot-Ledger*, *Sacramento Bee*, *Wall Street Journal*, *Washington Post*, *Washington Times*, *York Dispatch*.

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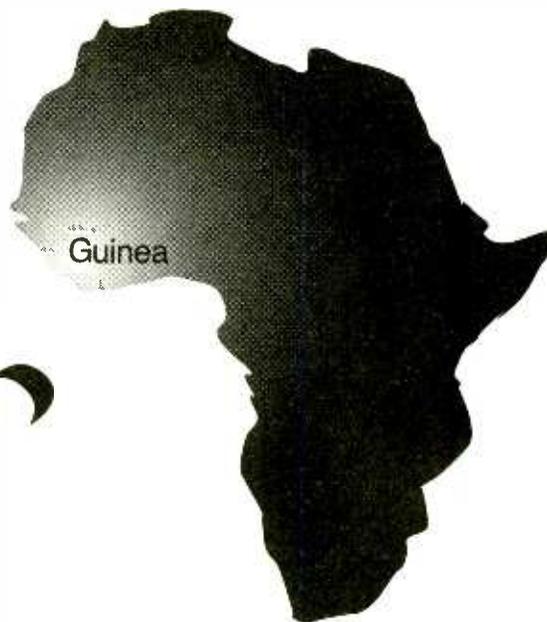
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Russians in the Savannah



By Mikhail Timofeyev
Photographs by Vladimir Rogal
Translated by Irinia Minina

Vladimir Rogal is one of the leading technical specialists of the State Enterprise of Broadcasting and Radio Communications No. 2 (GPR-2). The inspiration for this article came from an interesting meeting I had with him after he returned from a business trip in Africa. I hope the story is of interest to the readers of *Monitoring Times* as well. But, first, a few words about GPR-2.

This business, established 70 years ago, now broadcasts local and state programs, programs from independent stations, and various programs of the Voice of Russia (formerly Radio Moscow International), by means of its powerful transmitting facilities in St. Petersburg and Kaliningrad.

For many years GPR-2 has also provided technical assistance to a large number of countries. This article concerns one such successfully-completed project, and is based on information provided by Vladimir Rogal, who had also made a video about the reconstruction of the station in question. ... But everything in good time.

■ The Beginning

On March 23rd, 1991, a group of GPR-2 specialists boarded a plane from St. Petersburg, bound for Conakry in the West African country of Guinea. According to their contract, they, together with a construction crew, had eight months to reconstruct the transmitting center, "Centre Emitter de Sanfonja," which at that time was in extremely deplorable shape—broken windows, leaking roof, half-ruined transmitters.

The history of "Centre Emitter"—often called simply

"Sanfonja" after the nearest village—began 30 years ago. Built in 1961 with technical assistance from the USSR and subsequently given to the people of Guinea, its purpose was to strengthen socialism and disseminate communist ideas throughout the expanse of the African savanna.

Originally, Sanfonja was equipped with two 50 kW *Sneg* (snow) brand transmitters, made in the USSR, operating independently and either fed to different antennas, or both feeding the same antenna with the help of a special coupler. In 1976, according to the original description by Leningrad specialists from SUR-2 (forerunner of GPR-2), both transmitters were modernized and each transmitter's power increased to 100kW. The antenna system, consisting of several horizontal phased arrays of the "SGD" type, allowed the signal to cover azimuths to the North, East, and South—in other words, targetting practically all the countries of Europe and Africa.

However, partly due to the complicated political situation in the country, as well as the low level of operating skill, the radio center gradually fell into decay until it was finally out of action completely. Only a resolution by the military leaders of Guinea to renew national radio broadcasts on short-wave made it possible to breathe new life into Sanfonja; GPR-2 won the contract for reconstruction of the radio center over several Western firms.

Thus we arrive at March 1991.



A birds-eye view of "Sanfonja." The transmitters are located on the first floor of the right wing, with administrative offices on the floor above. The wing on the left houses a repair shop and power equipment, and an air-conditioning system. The towers for the phased array can be seen in the background.



Vladimir Rogal repairing a control instrument panel.

■ **230 Days to Rebuild**

As the work on reconstruction progressed, the group of GPR-2 specialists continually faced new problems. The biggest one was the problem of how to put both transmitters into operation in the shortest time.

The Sneg-type transmitters used anode-grid modulation and consisted of five separate block-sections: a modulation block, operating panel block, oscillator block, and amplification blocks for preliminary and output power. The “stuffing” of some blocks was completely replaced.

The staff at the center, headed by Alfa Silla, plus Modia Ba, the technical director, assisted wherever they could with the work being done by Vladimir Rogal—an expert even by European standards. As a result, by November 1991 a regenerated transmitter had already been put in place, looking as beautiful as if it had just arrived from the factory.

One of the most interesting and unexpected problems they encountered arose from a long-standing habit of the station staff, guards, and family members. They were accustomed to taking water for personal needs out of the drinking reservoir whenever the local water supply system broke down. This could have destroyed the transmitters, since their water-cooled system was also being supplied from that reservoir.

At last came the long-awaited day when the first of the two transmitters was ready for the mandatory 24-hour test operating, after

which—if there were no failures—the transmitter could be considered ready for operation. It was November 14, 1991, when the signal of “Sanfonja” sounded once again in the West African air on the frequency of 7125 kHz. One of the country’s leaders, who was on a visit to another African country at the time, was said to be quite astounded when he suddenly heard a strong signal giving the callsign of the newly revived national radio.

■ **Regular Broadcasting Begins**

It should be noted, by the way, that the operation of the revived Sanfonja transmitters did not go unnoticed by the international DXing audience, due, in part, to prompt reporting by the ubiquitous *BBC Monitoring Service*.

Regular broadcasting commenced February 1st, 1992. For the first month both transmitters broadcast on 7125 and 15350 kHz from 0600 to 0800, and 1200 to 2400 (in Guinea, local time is the same as in Greenwich, or UTC). State leaders had directed the local administrators to report the overall signal reception quality across the country. Unfortunately, this nationwide survey indicated that the frequency of 15350 kHz lost on all counts, when compared to the 7125 frequency. They decided, therefore, to discontinue using the 19 meter band, and to broadcast only on 7125 by alternating the operation of the two transmitters during the day. (Today, 4900 is reported as the primary frequency—*ed.*)

Experimentation also showed that the SGD-type antenna was able to spread a reliable signal throughout the territory.



Vladimir Rogal poses with his camera in the general hall, the transmitter to the left, and the operating panel to the right.

In fulfilling his guarantee of one year of broadcasting, however, Vladimir Rogal had to undergo one more challenge. On December 31st, 1992, a power transformer substation was put out of operation. As a result, the radio transmitters had to be supplied with power by the reserve diesel engine. Broadcasting time was reduced to a few hours a day and the power reduced to 50 kW. Sometimes the station wasn’t able to broadcast at all due to lack of fuel. Full power was finally restored when the repaired transformer was installed May 23rd, 1993. It was one of the last days of Vladimir Rogal’s stay in Africa.

Today Sanfonja is the only working shortwave transmitting site in Guinea; another one—constructed with help of the Czechoslovak firm “Tesla”—stopped operating long ago. Incidentally, the programming to be sent out by the shortwave transmitters is received by a German-made FM-tuner from a VHF transmitter in Conakry. The transmitting site itself is about 30 km from the capital.

■ **In Conclusion**

There may be other stories we’ll tell about the travels of co-author Vladimir Rogal and the specialists of GPR-2, since they have been travelling throughout the countries of Europe, Asia, Africa, and Latin America. Even though all these transmitting sites were erected back in the sixties and seventies with the sole purpose of extending the geo-political sphere of influence of the Soviet Union, for ordinary radio listeners and DXers they have meant the appearance of new countries and territories on the world radio map.

GPR-2 itself has a rich history, including their heroic activities during the Second World War. Today, their transmitting center near St. Petersburg is one of the largest in the world. I hope we will meet again in the pages of *Monitoring Times!*

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Leroy F. Schum:

HOMEFRONT HERO

of World War II

By Barbara Blossom

Leroy F. Schum of Reading, Pennsylvania, was too young for World War I and too old for World War II, but he served his country over and beyond the call of duty, nevertheless. To thousands of families across the United States he was an authentic hero. He attained that status with his shortwave receiver.

Schum's "war story" began in 1943. Twisting the dial on his receiver, he came upon a broadcast by Axis Sally, the German woman whose propaganda messages, delivered in a seductive voice, were meant to undermine the morale of Allied soldiers. Through the crackling static, Schum discerned the gist of the broadcast. Axis Sally was reading names of American soldiers taken prisoner by the Germans. She thought she was flaunting German successes and superiority. She actually was being helpful.

Inspired and thinking quickly, Schum grabbed a pen and wrote down as many names, hometowns, and serial numbers as he could. Sometimes, he was able to transcribe only segments of the information being broadcast. But he took what he had and sent penny postcards to the families, giving the news of their sons.

Some of his cards carried incomplete names and partial addresses. Some of them came back. But according to Leroy's son, John, who often was present when his father was listening and recording, many more reached their destination. John's wife, Josephine, in an interview after Leroy Schum's death, praised the Post

Schum confirmed the status of many American soldiers who had been captured by the Germans after he monitored shortwave broadcasts.

Office for delivery of the often half-addressed cards.

Josephine ("Jo") knew whereof she spoke. She had assisted Leroy from the time the young man she was dating, John Schum, left for the navy. When John received orders for duty in the South Pacific, the two became engaged (they were married in 1946) and Jo spent even more time helping her future father-in-law. Sometimes she wrote down the information coming over the air; sometimes she covered the broadcasts herself. She became as committed to this labor of love as Leroy was.

When working together, Leroy and Jo recorded as much as they could while Axis Sally and others gloatingly read the names into the microphone. Their combined efforts increased the efficiency and accuracy of the project. By then, Leroy was monitoring the programs seven days a week, from early morning until late at night. His listening started at 7 am and often continued until 1 or 2 am.

In addition to monitoring the broadcasts and mailing the cards, Leroy kept records of his activities, logging and filing each response he received. They came from every state in the Union. The material was almost thrown out by mistake following his death in 1985 at age 82, but the boxes of letters, cards of thanks, and some of the records fortunately were rescued from the trash pile at the last minute.

The Schum family believes that another ledger containing his complete records probably exists but hasn't yet been found. A 1945 story in the local paper about Mr. Schum's mission on the home front mentions such a book. When asked how he can be certain, since his father's complete log is missing, that more than 3000 cards had been sent, John Schum's answer comes quickly. "I have a carton full of letters from grateful families thanking him."

John Schum described the cards. Some were handwritten, others typed. They came from all over. The senders were from all walks of life, the messages often simple, and always poignant. A typical response came from a William M. Watts of Drexel Hill, PA: "How can we thank you enough... We deeply appreciate it and the relief it brought to our anxious minds. Yours is surely a blessed service—to bring relief and encouragement to waiting parents."

All of the cards were in a similar vein: "Your card...really brought comfort to me and my entire family. May God bless you for your kindness." (Steelton)

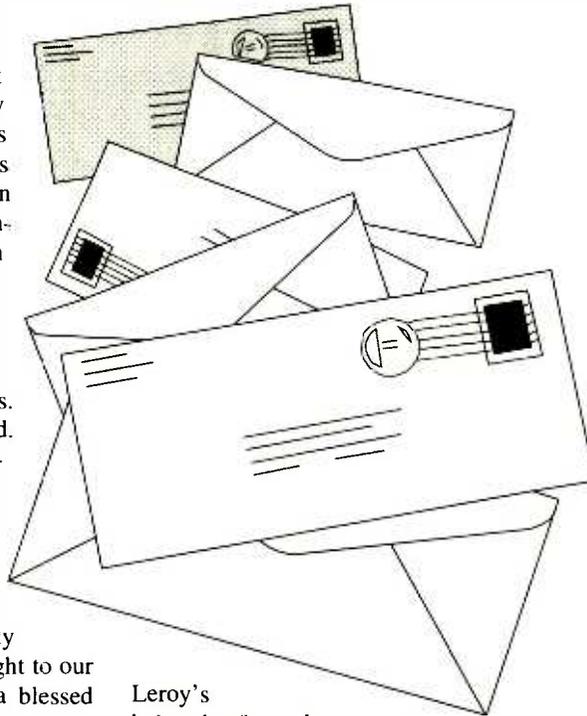
"I was more fortunate than most mothers. My son was missing only three months, but each hour of that uncertainty was endless waiting...It was very kind of you...to ease our minds." (Harrisburg)

"I want to thank you for being so kind...For three months I've known he was missing in action...He is my only son so you can imagine how I feel. Thanks a million for relieving a mother's mind." (Pittsburgh)

When a POW's address was in or near Reading, Schum sometimes made a phone call to relay the news. "It's the biggest kick I get," he said at the time, referring to the local names. "I've had 15 from this county and some from adjacent counties. Sometimes they (the families) don't want to believe me."

A high point was the time he heard two Ernests mentioned, but he caught neither last name. He had a Philadelphia cousin named Ernest Fisher who was missing action. Could it be?? He reported the possibility to his aunt. A few days later she called saying someone else had deciphered the whole name and sent her a card. It was, indeed, his cousin Ernest.

For a time, Leroy Schum assumed his project was unique. But a letter from an Ohio woman, in addition to thanking him for his card, reported that she had received 15 such notices from other shortwave enthusiasts around the country. Sometime later, with



Leroy's help, she formed the Short Wave Amateur Monitor Club, which grew to 46 members. The members refused compensation for their efforts but did accept stamps to help with the mailings. According to Leroy's son, when money was sent, his father sent it back immediately if a return address was included.

Leroy's activity came to the attention of the FBI, whose agents suspected he had a "racket" going. They thought he might be illegally charging for the information he mailed out. Soon convinced he was on the level, and a loyal American performing a valuable service on the home front, they gave him their blessing and told him to continue with his beneficial work. They even dropped in on him occasionally to see how his hobby was progressing.

Alicia Bruckhart, Leroy's great granddaughter, is responsible for reviving memories of Leroy Schum's wartime "service." A few years ago, given an assignment in school to write about a family legend, she "interviewed" her family for a possible topic. The almost-forgotten endeavors of Leroy Schum were then fondly remembered. Alicia had her story—one she's not likely to forget. Someday she'll probably pass it on to her own children. It's a heritage she can be proud of.

Axis Sally never realized what a service she was performing for her country's enemy. Near war's end, broadcasts were sporadic. Berlin was being bombed. Soon after, the broadcasts stopped entirely. The boys would soon be coming home.

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Monitoring the British Royal Air Force

The fifth largest air force in the world is the Royal Air Force (RAF) of the United Kingdom. While it is not as large as the U.S. Air Force or the Russian Air Force, the RAF has approximately 550 combat aircraft. The RAF does depend on a large HF radio system for command and control of its aircraft.

The RAF's airpower is divided into Strike Command and RAF Germany. Strike Command's primary responsibility is for home defense. It is comprised of four primary groups of squadrons as well as the "Queen's Flight," RAF transports, and Squadron 32.

RAF Northolt is the home of the Queen's Flight. This is the unit that flies the Royal Family when they travel via aircraft. Five callsigns most frequently associated with the Queen's Flight include: Kitty, Kittyhawk, Leopard, Rainbow and Unicorn (see table 1).

Another RAF callsign frequently heard on HF is 'Ascot.' The 'Ascot' call is associated with RAF transport aircraft. There are usually four numbers that follow the Ascot callsign. These numbers seem to have a pattern that indicates the task, unit, and type of aircraft being flown. Recently, some monitors in Europe have reported that 'RRR' was being substituted in place of the 'Ascot' callsign. Four numbers still follow after the 'RRR' call and it is believed that these still have the same purpose mentioned previously.

One European monitor reports that the only information one can reliably link to the 'Ascot' numbers is the aircraft type. He says that lists containing blocks of numbers allocated to certain routes are unreliable, and these lists are probably revised often. Most of the RAF flights are missions to wherever the RAF has fighter aircraft deployed or where other units (Army, Navy, etc.) need transport capability.

This same reporter indicates that the Ascot flights sometimes use only three numbers after the call. These are UK training flights, but they are rarely heard on HF.

It has been recently reported on the WUN (World Ute News listserver on the Internet) that the RAF has changed their tanker aircraft callsigns from the usual tactical calls to a single word callsign. 'Tartan' is the callsign used by the VC10 aircraft assigned to the 101 squadron. 'Fagen' is used by the L-1011 Tristars attached to the 216 squadron. Finally, the VC10 aircraft assigned to the 10 squadron are using the 'Madras' callsign.

Responsibility for RAF communications falls to the Strike Command

Integrated Communications System (STCICS). Main transmitter sites for the STCICS system are reportedly located at RAF Chelveston in Cambridgeshire and RAF Milltown in Moray, Scotland.

Receive sites for the system have been reported at RAF Bampton Castle, Oxfordshire, and RAF Kinloss, Moray. The STCICS system uses the general voice callsign 'Architect' and a CW callsign of 'MLP.'

In April, RAF STCICS changed some of their primary frequencies to conform to the new Aeronautical Off-Route (OR) 3-kHz frequency spacing plan (see February 1995 Ute World column). Ute World regular, Ary Boender, reported the changes in figure 1 via the WUN.

One of the most complete lists of RAF STCICS frequencies and designators ever published appears in Table 2. I would like to thank a friend in the UK and the fine folks at the WUN listserver for providing the background for this month's column. If you would like to learn more about

TABLE 1

Selected Royal Airforce Callsigns

Ascot	1 Group Air Transport and AAR (RAF Transport)
Kitty	Aircraft of the Queen's flight being used as a positioning flight or for carrying minor royals
Kittyhawk	Aircraft of the Queen's flight being used for a Royal flight
Leopard	Aircraft of the Queen's flight, The Duke of York - Prince Andrew (acting as the Captain of that aircraft)
Metman	Meteorological Research Flight
Navy ###	Royal Navy
Poachers	Poachers Display Team
RAF	Royal Air Force aircraft
Rainbow	Aircraft of the Queen's flight, The Duke of Edinburgh (acting as the captain of that Aircraft)
Red Arrows	Red Arrows Display Team
Red Devils	Red Devils Parachute Team
Unicorn	Aircraft of Queen's flight, The Prince of Wales (acting as a Captain of that aircraft)

In addition to the Queen's Flight, RAF units are located at the following bases:

- RAF Benson (EGUB) - Kitty/Kittyhawk flights
- RAF Brize Norton (EGVN) - 10/101/216 squadrons
- RAF Bruggen, Germany (EDUR) - 60 squadron
- RAF Coltishall (EGYC) - 6/41/54 squadrons
- RAF Coningsby (EGXC) - 5/29/56 (R)/F3 OEU squadrons
- RAF Cottesmore (EGXJ) - Nat'l Tornado Train. Establishment
- RAF East Midlands (EGNX) - Military Flight Check Unit
- RAF Finningley (EGXI) - 100/45 (R) squadrons
- RAF Leeming (EGXE) - 11/25 squadrons
- RAF Lyneham (EGLL) - 24/57 (R) squadrons/LTW RAF
- RAF Marham (EGYM) - 2/13/39 squadrons
- RAF Northolt (EGWU) - 32 Sq/CinC RAF Strike Command
- RAF Waddington (EGXW) - 8 squadron
- RAF Wittering (EGXT) - 1/20 (R) squadrons
- RAF Wyton (EGUY) - 51 squadron

FIGURE 1

RAF STCICS Frequency Changes

UPHAVEN (callsign Architect)				
AM/USB:	2591	4540	4742	5714
	6739	8190	9031	
Selcal/Phone Patch:	11205	11247	13257	
CW/Voice:	15031	18018		
ASCENSION (Voice callsign Haven)				
USB:	9031	11247		
CYPRUS Akrotiri (Voice callsign Cyprus)				
USB:	9031	11247		
GIBRALTAR (Voice callsign Gibraltar)				
USB:	11247			

the WUN, consult the Digital Digest column in this issue, as well as the MT Club Circuit listing for the WUN Internet news group.

Now it's time to see what you have been hearing this month in the Utility World. Till next month. 73 de Larry SK.

TABLE 2

RAF Frequencies and Designators (by designator)

Frequency	Designator	Frequency	Designator	Frequency	Designator	Frequency	Designator		
11204	A	18000	BS	10937	EX	6690	JT	5778	RE
5361	AB	2350	BT	11258	EZ	3380	KA	5695	RH
8156	AC	8982	BX	13257	F	3867	KD	5426	RM
9006	AD	8990	C	3102	FA	12057	KH	9459	RZ
3939	AE	8965	CA	8235	FB	4719	KJ	2763	SA
9022	AF	4763	CF	6730	FC	2641	KP	14812	SE
4822	AG	8965	CH	11208	FG	4730	KQ	2591	ST
3916	AH	18009	CM	18014	FM	4484	KR	6765	TG
5680	AJ	23245	CO	4742	FS	5420	KT	4951	TK
3039	AK	5658	CW	13205	FT	2261	KW	3391	TO
6748	AL	3116	CY	15064	FV	2577	KX	3345	TQ
3051	AM	29800	CZ	5721	FW	5447	L	4845	TS
6760	AN	4707	D	3155	G	2266	MB	4710	TW
11180	AP	5436	DA	15040	GA	5270	MC	5470	UA
2396	AQ	17984	DB	2274	GD	18825	MD	10919	UB
6870	AS	13245	DH	26385	GT	14460	ME	5330	UO
9001	AT	6734	DK	15031	H	3218	MS	6712	UQ
3855	AV	8996	DM	3893	HE	10420	MX	17975	UR
4042.5	AW	17369	DQ	8984	HJ	5471	NJ	4540	UT
3085	AX	6693	DS	9000	HK	5725	NR	11193	VD
4790	AY	23200	DT	6742	HM	3302	PA	11217	VE
23281	AZ	9031	DW	11272	HO	6757	PE	3120	WG
6739	B	3112	E	3845	HS	10634	PF	3880	WI
6737	BC	11220	EA	11234	HW	8967	PH	3026	WM
18018	BE	6740	EF	23257	HX	5095	PK	5403	XA
3130	BF	11247	EH	13234	HZ	6715	PO	11223	YC
3023	BG	23270	EI	13220	I	3864	PR	12295	YM
8980	BH	11185	EK	8987	IA	14724	PZ	23250	YP
17980	BJ	15013	EM	15093	IN	3512	QB	12389	YT
3947	BK	15076	EN	27000	IP	8972	QR	20030	YZ
15060	BL	15024	EP	8971	J	4739	QV	3763	ZA
2804	BM	4717	ET	3126	JN	8190	RA	5712	ZF
				5717	JP	5729	RD		

TABLE 3

RAF Frequencies and Designators (by frequency)

Frequency	Designator	Frequency	Designator	Frequency	Designator	Frequency	Designator		
2261	KW	3867	KD	5680	AJ	8982	BX	13245	DH
2266	MB	3880	WI	5695	RH	8984	HJ	13257	F
2274	GD	3893	HE	5712	ZF	8987	I	14460	ME
2350	BT	3916	AH	5717	JP	8990	C	14724	PZ
2396	AQ	3939	AE	5721	FW	8996	DM	14812	SE
2577	KX	3947	BK	5725	NR	9000	HK	15013	EM
2591	ST	042.5	AW	5729	RD	9001	AT	15024	EP
2641	KP	4484	KR	5778	RE	9006	AD	15031	H
2763	SA	4540	UT	6690	JT	9022	AF	15040	GA
2804	BM	4707	D	6693	DS	9031	DW	15060	BL
3023	BG	4710	TW	6712	UQ	9459	RZ	15064	FV
3026	WM	717	ET	6715	PO	10420	MX	15076	EN
3039	AK	4719	KJ	6730	FC	10634	PF	15093	IN
3051	AM	4730	KQ	6734	DK	10919	UB	17369	DQ
3085	AX	4739	QV	6737	BC	10937	EX	17975	UR
3102	FA	4742	FS	6739	B	11180	AP	17980	BJ
3112	E	4763	CF	6740	EF	11185	EK	17984	DB
3116	CY	4790	AY	6742	HM	11193	VD	18000	BS
3120	WG	822	AG	6748	AL	1120	4A	18009	CM
3126	JN	4845	TS	6757	PE	11208	FG	18014	FM
3130	BF	4951	TK	6760	AN	11217	VE	18018	BE
3155	G	5095	PK	6765	TG	11220	EA	18825	MD
3218	MS	5270	MC	6870	AS	11223	YC	20030	YZ
3302	PA	5330	UO	6995	BN	11234	HW	23200	DT
3345	TQ	5361	AB	8156	AC	11247	EH	23245	CO
3380	KA	5403	XA	8190	RA	11258	EZ	23250	YP
3391	TO	5420	KT	8235	FB	11272	HO	23257	HX
3512	QB	5426	RM	8965	CA/CH	12057	KH	23270	EI
3763	ZA	5436	DA	8967	PH	12295	YM	23281	AZ
3845	HS	5447	L	8971	J	12389	YT	26385	GT
3855	AV	5470	UA	8972	QR	13205	FT	27000	IP
3864	PR	5471	NJ	8980	BH	13220	I	29800	CZ
		5658	CW			13234	HZ		

Abbreviations used in this column

AFB	Air Force Base	ID	Identification
AM	Amplitude Modulation	IRNA	Islamic Republic News Agency
AMVER	Automated mutual-assistance vessel rescue system	MARS	Military Affiliate Radio System
ANG	Air National Guard	MFA	Ministry of Foreign Affairs
ARQ	Synchronous transmission and automatic repetition teleprinter system	MOI	Ministry of Information
ARQ-E	Single-channel ARQ teleprinter system	M/S	Motor Ship
ARQ-E3	Single-channel ARQ teleprinter system	M/V	Motor Vessel
CanForce	Canadian Forces	Nav	Navigation
CG	Coast Guard	ROU-ARQ	Romanian diplomatic version of the FEC teleprinter system
COMSUBLANT	Commander Submarine Forces-Atlantic	RTTY	Radioteletype
CW	Continuous Wave (Morse code)	SAM	Special Air Mission
DSR	Deutsche See-Reederei GmbH News Service	Selcall	Selective Calling
DWO	Duty Watch Officer	SITOR-A	Simplex teleprinting over radio system, mode A
EAM	Emergency Action Message	SITOR-B	Simplex teleprinting over radio system, mode B
ETA	Estimated Time of Arrival	Swed-ARQ	Adaptive Swedish diplomatic simplex ARQ teleprinter system
FAF	French Air Force	S/V	Sailing Vessel
FEC	Forward error correction teleprinter system	Unid	Unidentified
FEC-A	One-way traffic FEC teleprinter system	UNO	United Nations Organization
FF	French Forces	U.S.	United States
GAF	German Air Force	USAF	U.S. Air Force
GHFS	Global HF System	USB	Upper Sideband
HF	High Frequency	USN	U.S. Navy
HMS	Her Majesty Ship	WUN	Worldwide Utility News

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

2137.5 WLC-Rogers City Radio, MI, with SITOR-B MAFOR broadcasts for Great Lakes at 0219. (Jim Navary-Colonial Heights, VA)

2440.3 DER-MOI Bonn, Germany, with ARQ-E message to Berlin (channel ID BRVHF) at 2200. (Ary Boender-The Netherlands via Internet)

2442.7 DER-MOI Bonn, Germany, with ARQ-E message to Berlin (channel ID GOVHF) at 2141. (Boender-Neth)

2819.5 FDI-FAF Aix-les-Milles Air, France, with V CW marker at 0325. (Navary-VA)

2845.0 CFH-Halifax military with CW NAWS message using 75-baud RTTY at 0120. (Navary-VA)

2953.0 SYN131-Israeli Mossad number station marker with no text following in AM at 0312. This was also simulcast (in real time) on 4360.0 (Fri UTC). (Bill Fernandez-MA)

3269.0 USN MARS 4Q1B net at 0135 in USB. (Navary-VA)

3498.0 Unid stations (2) in communications via scramblers with USN type preamble burst in USB at 0420. (Fernandez-MA)

4035.0 US Army Mars Nebraska net in USB at 0215. (Navary-VA)

4106.0 LT working JHQ, XCJ, UWX sending 5-character groups in CW at 1012. Used standard prosigns (e.g. QSI, QRU, QRV, etc). Whoisit? (Navary-VA) *My best guess is US Army, based on what I've seen-Larry.*

4343.0 RKLK-Archangelsk Fisheries Radio, Russia, with traffic list (collective call is 4LY) in CW at 1820. A new frequency for RKLK. (Robin Hood-UK)

4372.0 USN Playground net involving trigraph callsigns and Giant Killer in USB at 0100. (Jeff Haverlah-Houston, TX)

4542.0 Magic 79 working Croughton GHFS in USB at 2332. Here from 6712.0 kHz. (Boender-Neth)

4560.0 SYN2-Israeli Mossad number station in AM at 0234, parallel with 6745. (Rich Baker-Austintown, OH)

4601.5 Irish Navy with reports of positions of fishing vessels off south coast of Ireland in SITOR-A at 1920. I see the 1995 Klingenfuss guide lists this as UNO Dublin. I don't believe it. (Hood-UK) SITOR-A messages to Dublin (0A) from 21 at 2018. (Boender-Neth)

4620.0 DER-MOI Bonn, Germany, with ARQ-E message to Mainz (channel ID RPVHF) at 1800. (Boender-Neth)

4675.0 Iqualit Radio, IDing as Frobisher Bay (Canada) working aircraft passing flight data and selcall check in USB at 0435. (Fernandez-MA)

4724.0 Andrews GHFS (as lead station) with 6/20 character EAM set at 0533 in USB. H1Q working Thule with phone patch to COMSUBLANT DWO for "Exercise Esteem Highly Alpha" traffic in USB at 0215. (Haverlah-TX) *Anybody want to take a stab at this Esteem Highly Alpha stuff?-Larry.*

4979.7 DER-MOI Bonn, Germany, with ARQ-E message to Stuttgart (channel ID BWVHF) at 1420. (Boender-Neth)

5024.5 DER-MOI Bonn, Germany, with ARQ-E message to Hamburg (channel ID HHVHF) at 1400. (Boender-Neth)

5045.0 English female 3/2-digit number station in AM at 0110 (Tue UTC). (Tony Thornton-Mize, MS)

5083.0 DHJ51-Grengel Meteo, Germany, with 100-baud RTTY coded weather at 1225. (Boender-Neth)

5262.8 DER-MOI Bonn, Germany, with ARQ-E message to Potsdam (channel ID BRVHF) at 1925. (Boender-Neth)

5265.2 DER-MOI Bonn, Germany, with ARQ-E message to Munchen (channel ID GSVHF) at 1415. (Boender-Neth)

5268.0 HEP-Unid station with V CW marker at 2220. (Jack Dix-Yonkers, NY) *My notes indicate this is the Interpol station at Berne, Switzerland-Larry.*

5376.5 OST-Oostende Radio, Belgium, with traffic list in SITOR-B at 1908. (Hood-UK)

5446.5 FDC-FAF Metz-Frascaty Air, France, with V CW marker at 2220. (Dix-NY)

5649.0 Swiss Air 101 working Gander Radio with selcall check in USB at 0328. (Navary-VA)

5700.0 Mayflower working Nightwatch 01 in USB at 2208. (Haverlah-TX)

5901.0 JSR-Israeli Mossad number station in USB at 2230. (Boender-Neth)

6227.0 KFN258-G&B Marine Houma, LA, working ??? Boudreaux in USB at 1247. (Navary-VA)

6262.5 UAGK-TH Kapitän Byankinat 0735 in SITOR-A with DISP-1 report to Vladivostok Radio after sending KXXM selcall. (Baker-OH)

6302.0 LYES-TR *Suomiyos Ilanka* at 0523 using 50-baud RTTY to LYL-Klaipeda Radio, Lithuania, with administrative messages and crew telegrams. (Baker-OH)

6333.5 XSZ-Dalian Radio, China, with CQ CW marker at 1052. (Dix-NY)

6336.7 MTO-Royal Navy Rosyth, England, with 75-baud RTTY availability messages at 1222. (Boender-Neth)

6465.5 ROD7-Murmansk Fisheries Radio, Russia, with CW marker ID at 0718. (Hood-UK)

6502.0 TBB6-Turkish Naval Radio Ankara, Turkey, at 0101 with V CW marker. (Baker-OH)

6535.0 Chilean Air Force 996 working Dakar Radio, Senegal, with position report in USB at 0537. (Navary-VA)

6550.0 Netherlands CG03 working Savannah in USB at 1753. Moved to 3357. (Boender-Neth)

6628.0 New York Radio working Cubana 479, KLM 772, Air Liberte 815, and Caledonian 78 all with position reports and selcall checks in USB at 0220. (Navary-VA)

6645.0 JM Jarre 5-digit number station in AM at 1800. (Boender-Neth)

6694.0 CFH-Halifax Military at 2243 in USB working CanForce 630 with phone patch to Trenton command post and Metro. (Baker-OH)

6706.6 Unid station idling in SITOR-B then calling QEMP in SITOR-A mode for only about ten seconds then gone at 0410. (Navary-VA)

6712.0 FAF aircraft noted here in French at 2355 in USB. (Navary-VA)

6715.0 GAF 852 calling DHM91 in USB at 0316, no joy. (Navary-VA) Hickam GHFS working McClellan GHFS with voice and adata traffic in USB at 0352. (Haverlah-TX)

6736.0 Sidecar working various Canadian stations in USB at 0015. (Haverlah-TX)

6739.0 Lena 27 working Andrews GHFS with phone patch to Shadow Ops in USB at 0458. (Haverlah-TX)

6777.4 USAF MARS packet network with various stations and beacons copied at 0450. (Navary-VA)

6779.0 Following German Navy ships working/calling DHJ59 in RTTY at various times: DRAN-FGS *Augsburg*, DRAG-FGS *Rommel*, and DRHM-unknown. (Navary-VA)

6871.0 HEP-Unid station with V CW marker at 2320. (Dix-NY) *See 5268.0 comments-Larry.*

6940.2 FKS23-Unid French station with test call and RYs (to FKS) in 50-baud RTTY at 0737. (Hood-UK)

6959.0 M16 Lincolnshire Poacher number station in USB at 2145 (Sat UTC). (Dix-NY)

6993.0 SAM 203 working Andrews (Mystic Star) in USB at 0030. (Haverlah-TX)

7302.0 USAF MARS net at 1324 in USB with station check-ins (Baker-OH)

7404.0 German female 5-digit number station in AM at 2145. (Dick Pearce-Brattleboro, VT)

7445.0 KPA2-Israeli Mossad number station in AM at 2215. (Pearce-VT)

7475.0 Fogcount working McClellan GHFS on 11244 at 0247 in USB, then Nightwatch 01 on 5700, 7475, 3032. (Haverlah-TX)

7480.0 Spanish female (5-digit, I presume-Larry) number station in AM at 0300 (Mon UTC). (C.T. Miller-Albuquerque, NM)

7532.0 German female 3/2-digit number station in USB at 2320 (Mon UTC). (Dix-NY)

7606.3 RFHI-FF Noumea, New Caledonia, at 0407 in ARQ-E3 idling at 192-baud. (Baker-OH)

7790.0	Unid station (Mexican Police?) as reported by Don Moore in April WUN. Lots of traffic in Spanish using USB at 0020. Wish I could understand Spanish. (Navary-VA) <i>Me too!Larry</i>	
7926.0	Spar 65 working Andrews (Mystic Star) with signals checks and phone patch to Phantom in USB at 2312. (Larry Fowler-Falmouth, MA)	11410.0
7945.6	RFIC-FF Marine Dipermil, Paris, France, with ARQ-E3 96-baud French message listing ships and ports at 1751. Also caught RFVIT-FF Le Port, Reunion Island, with ARQ-E3 96-baud sending 5-letter groups at 0332. (Bill Mussen-Annandale, VA)	11460.0 11466.0 11659.0
8048.7	9BC25-IRNA Tehran, Iran, with 50-baud RTTY English news story about Muslims in Bosnia at 1940. (Mussen-VA)	12207.0
8240.0	DKWP-S/V <i>Adler von Luebeck</i> with AMVER position report in USB at 0452. GCOC-HMS <i>Monmouth</i> calling Portishead Radio in USB at 2117, no joy. (Navary-VA)	12478.0 12480.0
8294.0	WQX647-Sea Star Corp Gloucester, MA, calling vessel <i>Hannah Bodem</i> in USB at 0024. Naval Submarine Base working WR771 discussing arrival in USB at 0236. (Navary-VA)	12483.5 12555.0
8353.0	BOMU-M/V <i>Feng Sheng</i> (Chinese) working Norddeich Radio, Germany, in CW at 1422. (Hood-UK)	
8368.0	C6HU5-M/V <i>Merchant Princess</i> at 0020 in CW calling DAN-Norddeich Radio, Germany, with request to go to 350 K. (Baker-OH)	
8376.0	ENUY-TH <i>Yakov Bondarenko</i> at 0236 in CW with telegrams to Shamrock London. (Baker-OH)	
8391.5	UBSZ-NIS <i>Yuzhmoregeologiya</i> (research ship) at 0016 in SITOR-A with crew telegrams for Novorossiysk Radio. (Baker-OH)	12562.5
8402.5	UBOY-STRMK <i>Gradient</i> at 0515 in 50-baud RTTY traffic to Kaliningrad, uses hull number/ID "SRIM 8097 Gradient." At 2228, ELRA2-TN Katie using 50-baud RTTY with RYs to UIW-Kaliningrad Radio. At 2230 ESMI-factory fishing trawler BMRT 0606 using 50-baud RTTY to send crew telegrams using this hull number/ID. Ship's name was <i>Mys Arkticheskiy</i> , now uses <i>Zhatros</i> . (Baker-OH)	12674.0 12833.5 13211.0
8450.0	RUF9-Unid Russian station (probably Krasnodar) with nav warnings in CW at 1410. (Hood-UK)	13241.0 13375.0
8494.7	'D'-Single letter HF marker in CW at 2226. Also noted on 10871.7 and 7038.7. (Dix-NY)	13635.7 14341.2
8590.0	AQP-Naval Radio Karachi, Pakistan, with V CW marker at 2212. (Dix-NY)	
8645.5	FUJ-French Naval Radio Noumea, New Caledonia, with 75-baud RTTY RY test tape at 0954. (Mussen-VA)	14606.0
8650.0	SPB-Szczecin Radio, Poland, with ship traffic in SITOR-A at 2212. (Dix-NY)	
8655.0	UA13-Nakhodka Radio, Russia, with V/CQ CW marker at 1100. (Dix-NY)	14615.0
8656.5	DZM-Bulacan Radio, Philippines, with CQ CW marker at 1157. (Dix-NY)	
8694.0	XSZ-Dalian Radio, China, with CQ CW marker at 1203. (Dix-NY)	14750.0
8855.0	Brazilian Air Force 1 with Brazilian President onboard working Maiquetia Radio in USB at 2303. (Arsenio Fornaro-Brooklyn, NY)	14834.0
8916.7	Egyptian Embassy Amman sending SITOR-A traffic to selcall SSBT at 2252. (Navary-VA)	
8989.0	Navy 134 calling any station for radio check in USB at 2314. (Haverlah-TX)	15862.0
9014.0	Rufus 9 working Raymond 7; Raid 33 working Raymond 7; and Trailboss working Rufus 9 in USB at 1604. (Haverlah-TX)	15946.5 16084.0 16688.5 16689.5
9017.0	Nightwatch 01 passing a 74 variable character EAM (Preamble ZXFI6K) to Aromatic in USB at 1538. (Haverlah-TX)	
9021.0	Unid stations noted here in USB periodically testing at 1614. (Haverlah-TX)	
9023.0	Darkstar Oscar at 1538 in USB working Deerhunter with frequency change to B28. (Baker-OH)	16715.5
9154.0	D4B-Cape Verde Air, with 50-baud RTTY test tape at 2210. (Navary-VA)	16786.0
9186.0	HEP-Unid station with V CW marker at 1933. (Dix-NY) <i>See 5268.0 comments-Larry</i> . Noted same at 1142. (Boender-Neth)	
9320.0	SAM 972 working Andrews (Mystic Star) in USB at 2333. (Haverlah-TX)	16912.5 16951.5
10281.3	RFLI-FF Fort de France, Martinique, with ARQ-E3 96-baud controle de Voie at 2204. (Mussen-VA)	17940.0
10426.0	MI6 Lincolnshire Poacher 5-letter groups number station in USB at 1400 (Mon UTC). (Boender-Neth)	17973.0
10490.0	RDL-Unid CW station (also noted in an unid digital mode) with the following CW marker between digital message, "UUUU RDL (3x) T477975775 (3x)" at 1205. (Boender-Neth) <i>Wonder if this has anything to do with the log on 14834.0?-Larry</i> .	17975.0 17983.0
11072.0	English female 3/2-digit number station in AM at 2226 (Fri UTC). (Dix-NY)	
11120.5	FDY-FAF Orleans Air, France, with V CW marker at 1409. (Dix-NY)	
11175.0	MacDill GHFS working Primo 62 (KC-10) in USB at 1650. Andrews working NWN660 with phone patch to Andrews ops and a Navy commander in USB at 1710. (Kevin Biegler-Mound, MN)	17994.0
11217.0	Dixie 11 (KC-135 aircraft) working Dixie Control in USB at 2312 with ETA and inbound request. (Fowler-MA)	18208.5
11220.0	Apparatus working Nightwatch 1 in USB at 1731. (Haverlah-TX)	18762.2
11222.0	SAM 200 working Andrews (Mystic Star) in USB at 0220. (Fernandez-MA)	
11226.0	SAM 204 working Andrews (Mystic Star) in USB at 1322. (Haverlah-TX)	19225.7 19357.5
11232.0	CHR-CanForce Trenton Military working CanForce 6505 in USB with weather traffic at 1520. (Tim Dobbins-FL via Internet)	
11244.0	MacDill GHFS passing a 44 variable character EAM with AHZYU preamble at 1540 (Tue UTC) in USB. No apparent relay. (Larry Van Horn-Brasstown,	22374.0
	NC) Owl 44 at 1818 in USB working Andrews GHFS with phone patch to Raymond 21. (Baker-OH)	
	PCW1-MFA The Hague, Netherlands, with SITOR marker and CW ID at 2150. (Navary-VA)	
	SAM 29000 working Andrews (Mystic Star) in USB at 1649. (Haverlah-TX)	
	SAM 681 working Andrews (Mystic Star) in USB at 1720. (Haverlah-TX)	
	English female number station in AM at 1505 repeating "279, 279, 279, 123456789" repeatedly. (Pearce-VT)	
	Several Brazilian Navy ships in communications with Natal and Rio de Janeiro Radio in USB at 0010. (Fornaro-NY)	
	LENA3-M/S <i>Song of America</i> (Royal Caribbean Cruises) at 2114 in SITOR-A with telex for hotel reservations. (Baker-OH)	
	UTOK-TH <i>Akademik Evgeniy Paton</i> at 2254 in SITOR-A with two administrative messages to Odessa. (Baker-OH)	
	PPOB-M/V <i>Frotamans</i> at 1615 in SITOR-A with telex for ETA Port Houston using new 8-digit selcall 71007200. (Baker-OH)	
	4JGA-Tanker <i>Shamakhy</i> working UON-Baku Radio, Azerbaijan, (on 12626.5) from Black Sea. Vessel en-route from Constanta to Bosphorus in CW at 1350. The 4J.. series now allocated to Azerbaijan. Vessels are being heard with this call series and the Azeris are also altering the old Russian names of many of their ships, but Baku Radio is still using the old UON call. The other odd thing about Baku is that they use two telex channels (12626.5 and now, also 12650.5 for CW to ships). Other 4J.. ships heard with CW on 12561.0. (Hood-UK)	
	EQWV-TH <i>Solnechny Bereg</i> at 1933 in 50-baud RTTY with crew telegrams to Vladivostok Radio. (Baker-OH)	
	UHJY-TR <i>Ukrainskiy Komsomolets</i> at 2312 using 50-baud RTTY with crew telegrams to Moscow Radio. (Baker-OH)	
	DZP-Navaliches Radio, Philippines, with CQ CW marker at 1126. (Dix-NY)	
	Roomrent, Nightwatch 01, and Patchwork in USB at 1945, also 12070. (Haverlah-TX)	
	Andrews (Mystic Star) working SAM 204 in USB at 1755. (Haverlah-TX)	
	MI6 English female (Lincolnshire Poacher) 5-digit number station in AM at 1514 (Fri UTC). Also noted 1502 (Wed UTC). (Dix-NY)	
	'S'-Single letter HF marker in CW at 2215. (Dix-NY)	
	Farming personnel somewhere in Brazil with talk about tractors, cows, price of corn, etc. in Portuguese using USB at 2330. (Fornaro-NY)	
	Golpher 46/56 (C-130 from Minnesota ANG) working each other (air-to-air) discussing missions in USB at 1700. (Fowler-MA)	
	Ascension GHFS working King 83 (rescue aircraft) with phone patch to Taco Ops (ANG New Mexico) in USB at 2203. (Fowler-MA)	
	MIW2-Israeli Mossad number station in AM at 1417. (Dix-NY)	
	RKD-Unid stations with test tape. I have no record of this call sign or this frequency being in use previously. May be of interest to the "brotherhood." (John Doe-UK)	
	MFA Stockholm, Sweden, with SWED-ARQ traffic to Amb Kairo at 1220. (Robert Hall-Capetown, RSA)	
	MFA Madrid, Spain, with SITOR-A news bulletin traffic at 1233. (Hall-RSA)	
	English female 5-digit number station in AM at 1432. (Dix-NY)	
	VROV-M/V <i>Papago</i> at 1816 in SITOR-A with AMVER traffic. (Baker-OH)	
	C6QK-M/V <i>Barrington Island</i> at 1810 in SITOR-A with telex for ETA of Wandelaar pilot. (Baker-OH)	
	UHBG-TK <i>Novotsak-1</i> at 1740 in SITOR-A with administrative traffic to Novorossiysk Radio. (Baker-OH)	
	DSR Rostock, Germany, with a SITOR-B German news bulletin at 1914. (Dix-NY)	
	SUH-Alexandria Radio, Egypt, with CQ CW marker at 1512. (Dix-NY)	
	6WW-French Naval Radio Dakar, Senegal, with 75-baud RTTY test tape at 1940. (Roger Parmenter-Hyannis, MA)	
	Houston Radio, TX, at 2049 in USB working N7WG with phone patch traffic. (Baker-OH)	
	Nightwatch 01 working McClellan GHFS in USB at 1719. Also heard on 15016, 15043, 13242, and 15044. (Haverlah-TX)	
	Offutt off-frequency with a 44 variable character EAM (Preamble ZXS4L7) at 1926. Then Offutt broadcast a Foxtrot message at 1930. (Haverlah-TX)	
	Sikorsky 786 (CH-53 helo) calling Eagle (Stratford tower, CT) in USB at 0112. Passed inbound status after pulling CG-6016 aircraft off the beach rocks. 6016 made an emergency landing on beach rocks after severe vibration due to rotor blade separation. (Fowler-MA)	
	CHR-CanForce Trenton Military at 2051 in USB working CanForce 1812 with phone patch to Kelly AFB base operator. (Baker-OH)	
	Stewart command post working Reach aircraft about load problems in USB at 1500. (Van Horn-NC)	
	MFA Bucharest, Roumania, with ROU-ARQ transmission, unable to decode at 1117. (Hall-RSA)	
	FDY-FAF Orleans Air, France, with 50-baud RTTY at 1126. (Hall-RSA)	
	MFA Abuja, Nigeria, with FEC-A English traffic to all stations at 1131, first time heard. (Hall-RSA) <i>Congrats, Robert, very nice catch-Larry</i> .	
	UHXG- <i>Proliv Longa</i> working Sevastopol Radio using 50-baud RTTY at 0948. (Hall-RSA)	

Computerized Scanning

Computer-controlled scanning is the hot new trend. Gone are the days of sitting in front of your scanner radio and waiting for the search mode to find new frequencies. In today's high-tech world of scanning, a computer can be used to automatically log thousands of new frequencies. You can even purchase scanning gear (Optoelectronics "Frequency Scout") that will automatically "tune" your scanner radio to an active frequency!

To help you bring the world of computers into your listening post, I've compiled a list of the most popular computerized scanning equipment and software. As you browse the list, keep in mind that space limitations make it impossible to mention all of the products that are available.

Optoelectronics offers an add-on circuit board that converts the Pro-2005/2006 into a powerful computer-controlled scanning machine. Installation of the "OS 456" circuit board requires basic soldering skills and familiarity with a few basic hand tools. The instruction book is well-illustrated and features easy-to-read, step-by-step instructions. The trick to successful installation is to follow the instructions to the letter—including the placement of insulating spacers on the board. To complete their package, Optoelectronics also includes a software program called "Radio Manager for Windows." After the board is installed, load the software into your computer and you're ready to go! For more information, check out the pages of *MT* or contact Optoelectronics, 5821 N.E. 14th Avenue, Ft. Lauderdale, FL 33334. Telephone (305) 771-2050.

Once a scanner radio is equipped with a computer interface, it can be controlled with a variety of software. Here are the top favorites, listed alphabetically.

1) Probe: Select up to 4000 groups of 99 banks, containing up to 1000 frequencies. Banks can include descriptive fields with incremental search and tagging for easy identification. Status indicators and data include current active frequency, CTCSS/DCS/DTMF codes, modulation, signal strength, log, record, alarms, delays, current time, and most recent frequency activity. Operates with a "true database engine" which will access large frequency databases such as the PerCon or Grove FCC database.

Requirements: IBM/PC compatible, 640K RAM w/one free serial port and hard disk. *Note:* Probe software is designed exclusively for Radio Shack scanner radios that have been equipped with the Opto OS-456.

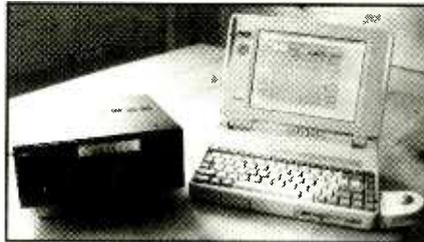
Ordering Info: \$99.95 plus \$7.50 shipping. DataFile Inc., P.O. Box 20111, St. Louis, Missouri 63123.

2) Radio Manager for Windows: Provides user control of scanning delay, priority channel, lock-outs and search ranges. Stores data in bank files with a total of 999 banks with 999 frequencies per bank. User chooses bank numbers and description.

Requirements: IBM/PC compatible 386 w/4MB RAM. Windows 3.1 or higher, hard disk w/2MB free space, 3.5 or 5.25 floppy drive.

Ordering Info: Ben Saladino, (817) 282-0331 or download sample from CompuServe's HamNet forum or from America Online's Ham Radio Area's Software Exchange. File name is RM.ZIP.

3) Scancat-Ver 6: Fast scan and search with user adjustable delay.



If you don't have a computer in your listening post, check out these software packages to find out what you've been missing.

Automatically counts active transmissions per frequency and will scan frequency banks simultaneously. Allows user to create 30 preset bands for customized listening. Will convert D-Base files, including Grove's FCC database on CD ROM. Supports multiple scanner radios.

Requirements: IBM/PC compatible w/ 640K RAM, 1 drive bay and 1 free serial port. Color screen preferable, but not required.

Ordering Info: \$69.95 plus \$5.00 shipping and handling from Computer Aided Technologies, P.O. Box 18292, Shreveport, LA. (318) 636-1234, FAX (24hrs) (318) 686-0449. (See p. 104 for review of Ver 6 and Scancat-Gold-ed.)

4) Scan Star: Allows multiple search ranges with selectable scanning priority. CTCSS tone controlled logging with the OS-456. Search and store mode finds new frequencies and automatically builds a frequency database. Multiple function permits background scanning while operator performs other tasks.

Requirements: IBM/PC compatible 386/486 PC w/4MB RAM, hard disk, VGA display. DOS 5 w/smartdrv and HIMEM.

Ordering Info: \$79.97 plus tax and shipping from Signal Intelligence, (408) 926-5630. Free Demo: Dial BBS #408-258-6462 and download file "SSDEMO.2EXE".

To use the software that was mentioned above, your scanning receiver must be computer-compatible. In advertisements it's referred to as an "RS-232 port." To make a Radio Shack scanner radio computer-compatible, you must perform a modification such as the installation of Optoelectronic's OS-456 circuit board or Bill Cheek's CE-232 (Commtronics, P.O. Box 262478, San Diego, CA 92196). At this writing, Opto has circuit boards for converting the Pro-2005/6 and Pro-2035. A few scanner radios, such as the AR-8000, are shipped from the factory with RS-232 capability.

The popular ICOM R7000 and R7100-1/R7100-2 do not have factory installed RS-232 ports. You must purchase a separate computer interface (CT-17). The interface is a stand-alone unit that connects the radio to your computer via cables. Controlling software must specify "ICOM compatibility."

In addition to the above, Grove Enterprises and several other merchants are also offering advanced scanning databases on disk and CD ROM. Database software allows you to research a vast amount of frequency information that would otherwise require days of exhaustive analysis. All you need is an IBM-compatible computer with the appropriate drive.

The Grove FCC Database is available on high density disk and CD ROM. It includes all licensees in the FCC Master File, including public safety, railroads, business, industrial, broadcast, maritime and many others. The CD-ROM version includes a mapping program that uses major streets and borders to show you where the transmitter is located.

Requirements: IBM/PC compatible 386 or higher. To use the mapping feature, you need a VGA card, 386 or higher, 4MB RAM and 10 MB of free hard disk space. A mouse is recommended.

Ordering Info: High density disks for CA, TX, & FL are \$49.95. High density disks for all other states are \$39.95. CD-ROM w/o mapping for

all states \$99.95. CD-ROM w/mapping for all states \$169.95. To order call 1-800-438-8155.

Computer-controlled scanning and computerized databases are here to stay. Before you decide to computerize your listening post, familiarize yourself with the market and take advantage of free software demo's. If you still have questions or need further guidance, you can reach me by sending an SASE to the Scanning Report, P.O. Box 98, Brasstown, NC 28902.

■ Treasure Hunt

Computer-controlled scanning is fun and exciting, but don't forget the most important link—your antenna! If you don't have a good scanning antenna, you won't hear everything that's out there to hear. To help you solve that problem, we're giving away the Scantenna from Antennacraft. The Scantenna is an omnidirectional antenna that will equal or outperform any antenna that may already be on your roof. To win the Scantenna, answer the following clues:

- 1) Spell out the abbreviation CD-ROM.
- 2) Hard drives are typically labeled as "A" or "B". True or false?
- 3) The FRG-9600, NRD-535 and MR 8100 are scanner radios. True or false?
- 4) Name the Uniden Scanner Radio with a dial.
- 5) I ordered catalog #ACC 74 from Grove. What did I get?

Frequency coverage for the Scantenna is 25 to 1300 megahertz and it is simply one of the best scanning antennas that you can buy. For more information on the Scantenna, check out the latest Grove Catalog and Buyers guide or visit your local CB/ham radio store.

TABLE 1

Most Active Frequencies during the Oklahoma City Bombing

155.670	Police State Net Ch. 1
155.490	Police State Net Ch. 2
158.790	Oklahoma City PD - Central
158.730	Oklahoma City PD - SWAT Team
463.575	Oklahoma City PD - K9 Patrol
468.575	Oklahoma City PD - Rescue Dogs, K9
158.760	Oklahoma City PD - Patrol, Crowd Control
453.600	Oklahoma City FD - Fireground #1
453.450	Oklahoma City FD - Fireground #2
453.700	Oklahoma City FD - Fire Chief Command Ctrl
453.350	Oklahoma City FD - Dispatch
156.690	Oklahoma City PD - Bomb Squad Tac Freq
864.2125	Oklahoma Highway Patrol - Main (OKC)
865.2125	Oklahoma Highway Patrol
863.2125	Oklahoma Highway Patrol
862.2125	Oklahoma Highway Patrol
861.2125	Oklahoma Highway Patrol
44.700	Oklahoma Highway Patrol - State Net #1
44.900	Oklahoma Highway Patrol - State Net #2
453.475	AMCARE Ambulance (OKC) Dispatch
453.975	AMCARE Ambulance Dispatch 2
462.950	Oklahoma City EMS (primary)
462.975	Oklahoma City EMS (secondary)
462.950	MEDI-Flight Helicopter (OKC)
155.340	St. Anthony's Medical Center
155.220	St. Anthony's Medical Center
155.295	Mercy Hospital
464.300	Salvation Army (Base) - OKC
469.300	Salvation Army (Mobile) - OKC
47.420	American Red Cross (Disaster Command)
47.450	American Red Cross
47.700	American Red Cross
154.830	Oklahoma State Bureau of Investigation (OSBI) - Command tac 1
155.640	OSBI - Secondary
153.755	Oklahoma City Civil Defense
158.910	Oklahoma City Civil Defense

■ Monitoring in Oklahoma

Richard Armstrong of Tulsa, Oklahoma, sent in a list compiled by the RVACS scanning club. Table 1 is an excerpt of some of the most active frequencies following the tragic bombing there in April.

Richard says, "Of course there were more ... the media band was so packed that the scanner stopped in the complete band several times. Cellular was so clogged, people's conversations were merging with others'."

■ Frequency Exchange

An anonymous contributor has provided the following frequencies for **Philadelphia, Pennsylvania**.

30.94	Trolley cars/repair/maint.	171.65	Indep. Park Rangers
30.98	Trolley cars/repair/maint.	412.275	Postal trucks
149.025	Aviation Supply Office,	415.05	Postal inspectors
149.95	Phila. Naval Yard Paging	464.30	Longwood Gardens
162.6875	Secret Service	502.6875	Transit police
162.7125	US Marshall	502.6125	Market-Frankford sub.
165.2375	Customs	502.7125	Supervision/Buses

Moving south, our next stop will be the **Capitol region in Washington, DC**. John Hartman has provided the frequencies for the National Park Service.

166.725	Dispatch	170.05	Antietam Nat. Battlefield
166.925	Dispatch	172.475 Maint.
166.85	Tactical	411.725 Surveillance
166.95	C&O Canal	411.625 Surveillance
168.30	Mem. Pky. maint.	411.825 JFK Center maint.

In **Arlington, Virginia**, we've been invited to visit with Bob Bell. Here are Bob's favorite frequencies.

154.13	Fire	453.30	Police
154.265	Fire	453.325	Police Admn.
154.28	Fire	453.825	Police
453.275	Police	453.60	Sheriff

Trunked Frequencies

811.4375	812.4375	814.4375
811.7625	812.7625	814.7625
811.9375	812.9375	814.9375
812.4375	813.4375	815.4375
812.7625	813.7625	815.7625
811.9375	813.9375	815.9375

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Continuing south, let's stop and chat with Ben Rossi. Ben lives in **Havelock, North Carolina**, and when he isn't fishing on the surf, he listens to the following:

39.18	Police (seldom used)	<i>New Bern</i>	
154.77	Police	46.42	Fire
155.655	Police	154.65	Police
155.97	Police	155.19	Police
156.15	Police	155.25	Police
458.225	Surveillance	155.97	Police

Trunked frequencies

811.2625	856.2625
812.2625	857.2625
813.2625	858.2625
814.2625	859.2625
815.2625	860.2625

Bill Scardino lives in **Darlington, South Carolina**, and he has invited everyone to monitor his favorite frequencies.

37.80	Water Dept.	158.22	Gas Co.
150.905	AAA Auto club	460.025	Police
154.13	Fire	460.10	Police
154.25	Fire	460.20	Police
153.89	Fire	460.25	Police
155.22	Ambulance	465.025	Police
157.725	Forest service	465.10	Police
158.205	Elec. Co.		

The last stop on our southern tour is **Laredo, Texas**. Jake Hopkins lives in the center of town and he says that you can stay as long as you want. Here is Jake's monitoring list.

151.865	Mercy Hospital	154.725	Police
153.89	Fire	154.785	Police
154.13	Fire	154.85	Police
154.19	Fire	154.90	Police
154.37	Fire	461.15	Mercy Hospital
154.515	Medical Corp.		

To 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. Submissions can be handwritten, printed, or on floppy disk. Requests for anonymity will be granted.

Eating with Bugs

Here's a story that you can take with a grain of salt. According to Gleb Esman, there's a Ramada Inn in New York that has placed electronic bugs in service areas and at restaurant tables. The bugs are activated on weekends, Friday nights through Sunday. Mr. Esman suggests that restaurant management is using the bugs to spy on waiters and waitresses who may be offering free drinks and food to customers.

The exact location of the hotel and the specific frequencies that were monitored were not provided. Are bugs hiding in your favorite restaurant? Take your scanner radio to dinner and let me know what you hear.

Computerized Roadways

The Virginia State Highway system will use computers to manage 19 miles of Interstate 64, Interstate 264, and State Route 44 in Norfolk, Virginia Beach, Hampton, and Newport News. The computerized system uses more than 600 roadway sensors and 38 closed circuit television

cameras to verify road conditions. The system is expected to be up and running by September 1, 1995. Communications between the sensors and computers is via fiber optics. Airborne radio signals are not utilized. (News clipping from Mark Saladino).

Cab Nabbed

A cab driver in Salem, Oregon, heard the description of a suspect who had robbed a nearby restaurant. A short time later, the suspect got into the cab and gave the driver a destination. Unknown to the suspect, the driver had already alerted his dispatcher via two-way radio, that he was picking up a person who matched the description of the robber. When the cab driver reached the rider's destination, the police arrested the bandit without incident. (News clipping from the *Statesman Journal*.)

Cellular Bandits

Cellular cloning involves duplicating the electronic signature of a cellular phone and then transferring that signature into illegal cellular phones. In an attempt to curb cloning, cellular phone companies have begun to implement cellular "authentication." Each cellular phone will be encoded with a unique cryptogram that must respond with a specific answer when "challenged" by the cellular network. According to the cellular carriers, the electronic responses will be scrambled and impossible to decode.

Post Office Scanning

The U.S. Post Office frequencies are interesting monitoring targets. Here are a few of the nationwide postal frequencies: 169.00, 169.65, 169.80, 169.85, 170.175, 406.325, 406.375, 409.175, 409.275, 409.45, 410.20, 410.325, 418.10, 418.30, 418.575.

Blue Angels

Here's the summer schedule for the Blue Angels flight team:

July 1	Redding, CA
July 8	Bushell Park, Canada
July 15	Hillsboro, OK
July 22	Pensacola Beach, FL
July 29	Kansas City, MO
Aug 5	Columbus, OH
Aug 12	Dubuque, IA
Aug 19	Reading, PA
Aug 25	NAS Miramar, CA
Sep 2	NAS Barbers Point, HI
Sep 9	NAS Whidbey Island, WA

No Tower Runways

What frequency is used at small airports with no tower? The answer is 122.800. Did you also know that the aviation band has been expanded? The new frequencies are as follows:

136.000	136.025	136.050	136.075	136.100
136.125	136.150	136.175	136.200	136.225
136.250	136.275	136.300	136.325	136.350
136.375	136.400	136.425	136.450	136.475

The expanded frequencies are not active in all areas. Check them out and let me know what you hear.

AR 8000

The New Concept - AR8000 shocks the market. AOR made every effort to incorporate the latest technology in to this new scanner.

• SPECIFICATIONS •

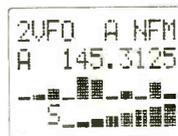
- Range: .5 - 1900MHz usable to 100kHz
- Modes: AM/NFM/WFM/USB/LSB/CW
- Stepsize: 50Mz to 999.995kHz
- Sensitivity(μ V): 30 to 1000MHz
SSB .2 AM 1.0 NFM .35 WFM 1.0
- Filters: (kHz) SSB 4 AM/NFM 12 WFM 180
- Memories: 50 ch. x 20 banks=1000 total
- Size/Wt.: 6.1 x 2.8 x 1.6 inch.
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- Clone your memory banks with a friend, load 1000 memory channels in seconds

.1 - 1900MHz*



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SDU 5000

The Spectral Display Unit adds a new dimension to the signal interception hobby. Imagine seeing stations above and below your receiving frequency. Usually the transmissions are short, perhaps 1 or 2 seconds. What are the chances of you being tuned to the exact frequency at the instant of transmission? Very slim. With an SDU you can watch for stations to pop up over a 10MHz window, then zero in. The SDU 5000 offers features unheard of only a year ago.



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Computer Interface for the AR8000

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- Δ 100% Shielded cable to receiver for reduced interference
- Δ PC Software included for Windows and DOS
- Δ Manual included
- Δ Detailed Programers documentation available
- Δ Designed and Manufactured in the USA
- Δ Optional 100% shield computer cable from AR8000INF to computer for reduced interference

Unlike some of the European devices sold today, this unit is smaller, lighter, and makes no power demands on your receiver. With the extra shielding and smaller size there is less chance of additional interference leaking into your radio. The AR8000INF is also the only interface that is upgradeable for use with the optional Tape recorder controller due first quarter '95.



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"Have I Overlooked Something?"

Let's just say I've been listening to shortwave for a long time. Over the years I've logged many stations in many countries. I've heard the rise and fall of nations, wars, rumors of wars, the passing of a Pope or two, and broadcasts of every kind imaginable. I've gone through a dozen receivers and several dozen antenna systems. I'm a typical "been there and done that" DX Dog.

One evening I was showing my logs and QSL collection to another long-time hobbyist. After my friend completed his perusal, he looked at me with a sardonic smile and said, "How come you never confirmed Radio Netherland?"

Boy, was my face red! The Dutch World Service is probably one of the first shortwave stations I ever heard, many years ago on my dad's old "marine band" radio.

RNW Flevo and Bonaire are in primary memory on my current crop of receivers. Heck, I've hung out with Jonathan Marks at radio conventions. This was an oversight of cosmic proportions.

Face it folks, radio monitoring can be as much an information hobby as it is a listening hobby. It doesn't matter if we are SWLs, scannists, hams, or BCB DXers. We tend to stand face

first in the data stream grabbing what we can and trying to make sense of it all for the further enjoyment of our monitoring. Sometimes in our quest to obtain more information, we neglect a few facts that can be important in the long run.

Let's start out with a look at the problem I faced. First things first, this oversight needed to be put in perspective. A typical Thursday evening listening to *Media Network* and about five minutes of typing a report coupled with an IRC brought the missing QSL into my collection. Fortunately Radio Netherland was still around and still QSLing. This cannot be said for many shortwave broadcast outlets. When I look over my logs I see at least a dozen places that just aren't there anymore due to the changing political

face of our planet. When I look at my QSL collection I see cards from several countries that are still on the map but who no longer confirm reception as a matter of policy.

■ Log Everything

A good skill for a beginner to develop is to log everything. Complacency in my logging practices led to the oversight with Radio Netherland. A well-used log book should be a source of both pride and useful information to the dedicated monitor. Going back over your log will help you fill any gaps in your monitoring practices. A logbook can serve as a reminder of stations that have been heard but not confirmed.

Logbooks can be purchased commercially, or you can develop your own. As more and more computers show up in our midst, many folks are foregoing the paper logbook in favor of using database management software to develop a logging program. For those of us who are not blessed with programming skills, radio hobby log programs are beginning to show up in both the shareware and commercial marketplaces. Regardless of which path you choose, a logbook or program only works if you use it. It doesn't matter if you input your data with a pen or a keyboard, you have to input the data. Get in the habit of relentless and tenacious logging early on in the monitoring hobby and you will discover its many rewards as the years go by.

Whatever logging system you choose to use, make sure your data includes at least time and date (in UTC format to avoid confusion when you write your confirmation reports), frequency, station name or callsign, station location and language used, signal quality (usually indicated in the SINPO format—see the September 94 column), program content, and the equipment used for monitoring. You should also include information about when you sent your confirmation report and when and if you received confirmation in the form of a QSL card or letter.

One thing that folks often forget in the pursuit of signals is to go back and read through their logbooks from time to time. Only by doing this will you notice any gaps in your totals or find stations that did not respond to your confirmation letters. Going back over your logs can give you insight into your own operating practices. You can learn to listen smarter with your log's guidance. The time and effort spent in compiling and studying your logbook will make any beginner an expert in no time at all.

BETHANY RELAY STATION VOICE OF AMERICA

September 23, 1944
November 14, 1994



Some confirmation opportunities disappear due to politics or policy.

■ What's All This Fuss about Confirmation?

Good question. Confirmation is certainly not necessary to listening. I even know a few folks who have been in the hobby longer than I have who have never heard the call of the QSL. Personally, I've always enjoyed finding a surprise to two in my mailbox in amongst the bills and advertisements. Some folks just do it during a certain stage in their listening history. If you are like most beginners, however, you will probably want to try your hand at the confirmation game.

Simply put, writing a letter to a station telling them what you heard and receiving a reply is a very rewarding experience. As a beginner, the sheer fun of amassing QSL cards from foreign lands is usually enough to keep you running to the post office to buy International Reply Coupons. Many SWL clubs offer awards for confirming a certain number of countries or countries from a particular area of the world. Chasing these awards encourages a beginner to focus his or her listening into more systematic practices. It forces you to pay attention to propagation and program scheduling (and it forces you to keep up with your logbook as I stated earlier).

However, it is down the road a few years that the real rewards to systematic and thorough confirmation efforts begin to show through. Take my personal example once again. If the gap in my collection was Radio Finland instead of Radio Nederland I would, for all intents and purposes, be out of luck. Several years ago Radio Finland decided that they would no longer respond to confirmation reports. Remember, no station is obligated in any way to confirm your reception. This is why everybody who writes on the subject of QSLing reminds folks to be polite when sending out confirmation letters. I would even go so far as to recommend taking the time to send a short thank you note when you receive your confirmation to let the folks on the business end of the radio know how much you appreciate their efforts.

I was lucky enough to log and confirm Radio Finland back in the seventies when they still sent out cards. If I had overlooked Finland and discovered the error now it would remain a hole in my collection that would be difficult to fill. I also look at my collection and see cards that could never be replaced. An example is my Radio Berlin International QSL. "The Wall" fell and the station disappeared to become part of a larger Deutsche Welle. Today's world gives mapmakers ulcers.

Economics can also affect QSL opportunities. On November 14, 1994, Voice of America's Bethany, Ohio, relay station ceased operation as a government cost-cutting measure. This is yet another confirmation that cannot be replaced. Passing up the opportunity to confirm any country or station can just as easily result in a card you could never receive or replace.

Mediumwave DXers have similar problems, only multiplied by an order of magnitude. Domestic radio stations go on and off the air with incredible frequency and often with little or no notice to the hobbyist. New ownership or changing program formats often result in a call sign change. My own local 50 kW Clear Channel station has been WCAU, WOGL, and now WGMP—all within five years. In the mediumwave world, waiting a few weeks to log a station can mean a clear miss.

Get the idea, folks? Confirm your loggings with alacrity because you never know when a station (or even a country) may go away. You might try a technique I have used for years. Most everybody has an evening where they forego logging "new ones" to actually sit back and listen to the radio. As I mentioned in my case study above, I've set aside Thursday evenings to listen to *Media Network* on Radio Nederland for years. Since I can type and listen at the same time, Thursday evening is the night I get everything ready from the previous week's loggings to go out in the Friday mail. A simple system such as this can

go a long way in making sure you never miss a confirmation. The omitted Radio Nederland confirmation occurred long before I got smart enough to get into my Thursday night routine.

■ Make a List and Check it More Than Twice

A couple of well-organized lists can also keep you on track with your long-range plan. Lists can serve to jog your memory about the gaps in your listening with more efficiency than digging through your log. You can keep a list at hand for a quick glance while you are listening. Hams have long used state and country lists to help them keep track of contacts and confirmations for awards such as Worked All States, Worked All Continents, and the DX Century Club. If you're out to run up your totals, either for awards or for your personal satisfaction, making up a list of countries heard helps you keep track of your progress.

You can also make up a "hit list" of stations you want to keep an ear open for. Once a month I go through the several shortwave bulletins and journals I receive to get an idea of what "missing" stations I might have a shot at logging. I make up a list of ten or so stations that I want to concentrate on. The list will include the station's name and the frequencies and times that the stations are likely to be heard in my neck of the woods. I paste this puppy up right over my receivers to keep me focused on the task at hand. This little reminder list has probably contributed more to my recent SWL successes than just randomly flipping through those bulletins and journals during a DXing session.

With a little bit of organization and a few minutes a week checking over your records, you, too, can avoid this old DX Dog's embarrassment next time you show off your QSL collection to your friends and fellow hobbyists. Fortunately, my beautiful "Floral Series" QSL cards that Radio Nederland sent me for Flevo and Bonaire have all their data on the *back*. No one needs to be the wiser when they look through my QSL album. Now if I can just keep it quiet until I log their Madagascar relay, nobody will be the wiser. Can you keep a secret?

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Signature _____

VOA Awaits the Verdict

If the Republicans' balanced budget plan were to pass, it would eliminate Voice of America. Even if modified, Joe O'Connell, VOA external affairs director, says, "It is bound to have an effect, and probably a serious one, on the resource picture for U.S. international broadcasting." VOA Director Cowan believes the VOA will probably survive in some form, with funding perhaps cut 10%, and possibly reorganized into a structure similar to the BBC. The services most likely to survive will be to areas where they are most needed. Says Director O'Connell, "Stay tuned." (rb; *VOA Communications World*)

Radio Martí used to be dropped into Fidel's back yard via the VOA's Bethany site, which is now dismantled. The Greenville, NC, site skips over Cuba, so now VOA wants to build a new high-angle antenna there. Delano, CA's monster curtain can't be slewed far enough around to hit Cuba. Your tax \$\$ at waste...oops, work, says ex-VOA engineer John Vodenik, in comments he made on USENET and forwarded via Thurman. Meanwhile, he says, R. Martí has bought time on nearby WHRI, Indiana, 9495, at 0200-0500. In more commentary from Vodenik, forwarded to us by Diane Mauer, he says the engineering budget for VOA Washington has to be cut by \$20 million by end of fiscal year Sept. 30; staff is to be cut from 205 to 160. The biggest slash planned is 25% for the '96 Fiscal Year.

ALGERIA RAI's only English is now 2000-2100 on 50 kW 11715 to Central Europe (Daniel Atkinson, UK. WVHA *DXtra*)

ARMENIA VOA, Yerevan, in April had English at 2145-2200 on 11920 (Kevin Hecht, PA, *World of Radio*) But by May had shifted another hour earlier, 2030-2100 on 11920, also announced but not heard on 11960 (Eugene Gebruers, RVI *Radio World*) Actually still at both times (Hecht)

AUSTRALIA ADFR to peacekeepers abroad: 0100-0200, 0430-0530, 1000-1100 on 13535; 0800-1000 on 15605, 18191; 1400-1500 on 8743, 10621 (Andreas Erbe via RadioRopa *Radio Treff* via Wolfgang Büschel) **R. Australia** has new phone numbers: 61-3-9626, ext. 1800; open line [answering machine?] ext. 1825; fax 1899; transmission management ext. 1912/1913/1914, fax 1917 (Andreas Volk, Germany, via Bruce MacGibbon, R. Japan *Media Roundup*)

BRAZIL R. Gaúcha on 11917.2 at 2335 ID, news, ads (Ed Rausch, NJ, HCJB *The Latest Catch*) **R. Juratel** is experimenting via **R. Bandeirantes**, with gospel music fed by satellite, on 11925 (Turelli & Partamian, *DX Clube Paulista* via *Play-DX*)

BULGARIA R. Bulgaria carries out regular bimonthly quizzes; most interesting answers to one question on our broadcasts will be awarded exciting prizes—cassette tape of folk music, Bojidar Dimitrov's book *Bulgarians—Civilizers of the Slavs*, and a surprise souvenir. Postmark deadline June 30, etc. Questionnaire also asks if you would like extended weekend broadcasts, and if so, day and time UT; may fax to 003592/87 10 60 (via Bill Flynn, OR)

CANADA *Now the Details*, CBC media review show is not only on RCI UT Mon 0231 on 13670, 9755, 6120, but also on CBC Northern Quebec Sun 2230 on 9625 (gh) CBC Radio Network since May 1 has been relaying overseas stations overnight, tape-delayed and with usual local timezone delays: 1 am, RFI; 2 am, R. Netherlands; 3 am, R. Sweden; 3:30 am, BBC *Europe Today*; 4 am, Deutsche Welle; 5 am, R. Australia; but not starting in Québec until July, Maritimes Sept. 1; crystal clear, satellite fed (Larry Shewchuk, Manitoba, *W.O.R*) Takes feed from World Radio Network (*SCDX/Mediascan* via Thurman) Confirmed R. Australia here on CBW 990 Manitoba after 1000 UT but interrupted for CBC news, weather (gh, OK)

CHINA [& non] CRI made usual summer change to 1300 & 1400 UT, staying on 7405 direct; best signal and audio by far, tho a bit late in the east, again via French Guiana at 0400 on 11680 (gh)

COLOMBIA Caracol Vélez, 4231.1 has local ID at 1050 and local

ads, joins net after 1100. Another harmonic is Caracol Pasto, 6400 = 5 x 1280 (Henrik Klemetz, HCJB *DX Partyline*)

COSTA RICA In the wake of Oklahoma bombing, RFPI stepped up *Far Right Radio Review* with special editions, and weekly live call-in UT Weds 0200, some extended a sesquihour or more pre-empting *World of Radio*. Voltage fluctuations from 250 up to 300, and lower than normal damaged some equipment. *Feminist International Radio Endeavour*, daily 1700, 0100 and 0900, won 1995 awards from UNESCO and Women's International News Gathering Service (RFPI)

CUBA RHC has gone capitalist—ads for a Cuban airline with a Montreal office (Kevin Hecht, PA) Not exactly, no doubt state-controlled. RHC announces that *Mailbag* now airs both Sundays and Wednesdays. English at 2100-2200 on 11705 ex-11720, but had a hard time finding clear SSB channel then or at 2200-2300; finally picked 11960 for the second hour. Spanish at 2100-2300 on 11760, 15230, 9820-USB; 1100-1500 on new 6000, 1100-1300 on 11875, 0000-0500 on 15230, 5965, Visiting Havana? RHC is still in the Radio Progreso building, 5th and 6th floors at Infante 105 (*En Contracto*, gh)

CZECH REPUBLIC R. Metropolis will not have its license renewed next Jan. 1 (*Lidove Noviny* via BBC Monitoring) Apparently went broke with SW tests (Chris Greenway, BBCM, RNMN)

ECUADOR HCJB to Europe 0700-0830 chose 11835 instead of 11635, but interference there, too, so finally (?) landed on 11615. Rich McVicar confirmed the twice-hourly timesignal, three shorts and a long, is V for "Victory over death in Christ Jesus" (gh)

EQUATORIAL GUINEA R. Africa, All-American-religion in English, 2000-2300+ on 15186+ (Kevin Hecht, PA) 2300* on 15186.5 with anthem (Joe Hanlon, PA) 15186.32v, 2205-2256* announcing 7190, loud signal in clear but distorted audio (Randy Stewart, MO) Malabo, 6250 fax is +240-92097 (BBCM)

RAIF/FIRE
programa radio internacional feminista
feminist international radio endeavour

*All times UTC; All frequencies kHz; * before hr = sign on, after hr = sign off; // = parallel programming; + = continuing but not monitored; 2 x freq = 2nd harmonic; Z-95 = summer season*

FRANCE On RFI, David Page acknowledged the echo problem on 13625 at 1200, blamed it on "atmospheric conditions," to be solved by installing delay at Guiana relay. But it must have been caused by a second transmitter at another site, and whoever decided this should have known they would have to be synchronized. (gh) (See page 118 for more-rb) RFI has a Spanish DX program, *Mundodiexista* on the 2nd & 4th Fridays at 2335, Sat 0135, 0535 (*Conexión*) Actually heard at 2340-2355, on 17620, 15200, 13640, 11995, 11670, 9800; 0140 on 11995, 11670, 9800, 5920; 0540 on 9800, 5920 (gh, sked via Bob Thomas)

GERMANY DW has started upgrading the Nauen site west of Berlin to become the most modern SW site in Germany, with 4 x 500 kW Thomcasts, Alliss rotatable antennas, remote-controlled from Cologne (Wolfgang Büschel, Stuttgart) Thanks to a tip on *World of Radio*, I tuned into DW's *Stadtbummel* last November, entered the contest, and was astonished when notified I won first prize—an all-expense-paid trip to Germany for one week, which I hope to take this summer (Tim Hendel, FL) Next one should be Sunday July 23 or 30 for a sesquihour at 0532; 1332 on 15275, moving at 1400-1500 to 17765, 17715, 17560, 13790; repeated 2132-2300 on 17810; until 2200 also on 17860, 15275; after 2200 on 15410, 13780, 11785, 9765, 9545, 6100 (gh)

GUAM In May, *Wavescan* vanished from the Sat & Sun 2300 airings on KSDA, 11980 (gh)

INDONESIA Next time you hear RRI Pontianak, try not to think of what the city name means (gh) 3976.7 at 1440-1546, best Indo two mornings in a row well past sunrise. Bizarre DX Fact: *Indonesia Handbook* says Pontianak means "vampire ghosts of women who have died in childbirth" (Guy Atkins, WA, *Fine Tuning*)

JORDAN R. Jordan on new 15270 in English 1420-1520+, pop and disco music, 1500 news; is this ex-9560 or in addition? (Randy Stewart, MO) Also fade-in here 1420, mostly pop music and BBC transcriptions, news also at 1600, off at 1633* (gh, OK) Also at 1100 on new 15170 (Joe Hanlon, PA) Until 1154* and the 15270 broadcast, is announced as to North America (Kevin Hecht, PA) Also new powerhouse 15290 in Arabic 0430-0714* // 11810 and expelled HCJB on 11835 (Wolfgang Büschel, Germany) *1000 Arabic on new 15355 (Gerhard Widera via WB)

MEXICO XERMEX, 9704.98, had English news around 0223-0230; poor with strong carrier, weak modulation, lots of adjacent splatter (Brian Alexander, PA, *World of Radio*)

MONGOLIA R. Ulan Bator English for Z-95: 0300-0330 N. Am. 12000 9960; 0910-0940 Australia on same; 1445-1515 SE Asia 9950 7293; 1930-2000 Eu 7530 4080 (S. Aoki & Y. Kato, R. Japan *Media Roundup* via John Norfolk, Diane Mauer) No mention of day-of-week variations; has anyone even in western N. America ever heard the 0300 broadcast? (gh) difficult reception on 7530 at 1930 (Michael Osborn, UK, BDXC *Communication*)

NETHERLANDS ANTILLES R. Netherlands J-95 at 2330-0125 shifted 9840 to 9845 to avoid Kuwait; 0730-0825 on 9700 in NZ absence // 9720 (Via Pete Costello; RNMN) For program previews listen daily at 0025, 0225, 0825, 1425, 1925 (via Diane Mauer) DW using Bonaire relay 0500-0550 on 5960, 250 kW 305° (Wolfgang Büschel) Originally planned to be Germany or Portugal, and ex-Antigua; no site ID but before 0500 runs satellite info not // 6175, 6185 and others (Kevin Hecht, PA) Presumably downlinked to Hilversum that way (gh) Like last summer, Dutch at 2130-2225 from RN on 15315 and 15155 put spur on 14995 (Hecht)

NORWAY R. Norway at 1300 to N. America replaced 11850 with 15340 (Bob Thomas, CT) Escaping Thai co-channel (gh)

PALAU KHBN was off 9830 and 15140 in April, installing five aerials for India/China; 3rd transmitter later in year (Arthur Cushen, NZ, RNMN)

PARAGUAY AWR has been granted permission for 2 x 50 kW SW, but the project will not proceed unless also granted AM or FM outlet (Adrian Peterson, AWR) **R. Nacional** has been off-frequency, heard on 9736.9, later 9736.2 from 2300 Paraguayan music until 0359* (Ernie Behr, Ont.) 9736.6v 2154-0225 (Carlos Gençalves, Portugal, and Frank A. Baldwin, UK, DSWC1 *SW News*)

PERÚ For a while, 5275.6 station was **Estación N-C** as in Nueva Cajamarca, but then renamed **Estación Láser**, good until 0300*, still at Avenida Nueva Cajamarca 311; Láser no longer heard on 3818, so maybe merged. **R. San Miguel Arcángel** back on its original frequency 5721v, after a while on 6739, fair until 0300* and sometimes inverts ID. **R. Soledad** again on 4673v ± 1 (Henrik Klemetz, Colombia, HCJB *DX Partyline*) **La Voz de Santa Cruz**, new on 6360 at 0015-0343, many IDs, not heard around 1000 (Hans Johnson, MD, *Jihad-DX* via HCJB *DX Partyline*) also heard until 0440* (Dave Valko, PA, *ibid.*) Another new one in Santa Cruz, but couldn't understand ID, on 5556.26 at 0308-0337* (Rich McVicar, Ecuador, *ibid.*)

PHILIPPINES **Bulan Radio** coastal station, relays morning news from DZMM, 630, on 13170 USB daily at 2300-2337v, mentions ABS-CBN network (Takayuki Inoue Nozaki, Japan, *Play-DX*) **R. Veritas Asia** has two transmissions beamed east of north, and ultimately crossing N. America—one we have often noticed at 1230-1255, Pilipino on 9505 at 30° across Bethel and Juneau, Medicine Hat, Kansas City, Mobile, Havana; and at 2130-2225, Russian at 15° across Washington DC, Santo Domingo (gh, sked via Bill Westenhaver, RCI) **R. Pilipinas**, English at *0230-0330* on 21580, 17760, 13760 (John Wright, NSW, *Australian DX News*) Could 13760 be a receiver image of 17760? (Craig Seager, ADXN ed.)

PORTUGAL Radio Portugal, M95 in English, presumably continuing J95, Monday-Friday only ME 1330-1400, 21515 [sic; had been 1430 or 1530], Eu 1900-1930, 6130, 9780, 9815, Af 1900-1930, 15515, NAm 0130-0200, 6075, 9570 [has been on 6175]. After News, features are: *MonVisitor's Notebook*, *TueMusical Kaleidoscope*, *Wed Challenge of the 90s*, *Thu Spotlight on Portugal*, *Fri Listeners' Mailbag* or *DX Program* or *Collectors' Corner* in 3-week rotation (via Gigi Lytle, TX).

RUSSIA VOR resumed separate service to west N. America at 0600-0700 at least on 12040. VOR language count peaked in 1975 at 65 as R. Moscow, now down to 30 totalling 616 program hours per week, in 6th place behind DW at 620, BBC 904, CRI 910, RFE/RL 986, and VOA/R. Martí is first at 1100; as recently as 1990, R. Moscow was first at 1545 (BBCM)

SAIPAN KHBI, Monitor Radio Int'l, for J-95, always subject to change: 0800 on 9425; 0900-1100 on 9430, 13625; 1100-1300 on 9355, 9425; 1300 on 9355, 13625; 1400-1800 on 9355; 1800 on 9355, 13770, 1900-2000 on 13770, 2100 on 13840, 2200-2400 on 13625, 15405 (WSHB)

SAUDI ARABIA BSKSA Riyadh, Holy Qur'an superpower on new 15705 at 1400-1605 // 9730, 15280 (Wolfgang Büschel, Germany)

SEYCHELLES FEBA J-95 English: 9810 at 1500-1600 Tue-Fri; 12090 at 1500-1540 Tue-Fri, -1545 Sat/Sun/Mon; Fri 0500-0545 on 15555 (HCJB *DXPL* which gave days one day earlier) Verie letter received direct from BBC relay, Box 448, Victoria; fax 378500, from Peter Lee, Resident Engineer; said feedline is Kabel Metal 9-inch coax (Dave Jeffery, NY)

DX Listening Digest

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SPAIN Personal to Terry Burgoyne at REE: did you ever get my aerogramme last year explaining my previous criticism of *Distance Unknown*? You never acknowledged it on air or otherwise; are you getting your mail? (gh)

SWEDEN R. Sweden announced answer-line, 46-8-764-7247; fax - 660-2990 (gh)

SWITZERLAND UN Radio resumed tests from Geneva, 0700 & 1800 on 10461 USB+carrier, 15 kW (Guido Schotsmans, DX Antwerp via Andy Sennitt, RNMN) It's 0600 & 1800 on 10461, 1200 on 17520, per QSL (Max van Arnhem, *SW Echo* via NASWA Journal)

Red Cross Broadcasting Service is reorganizing programming; monthly 5-language broadcasts via SRI suspended until Sept; then will launch new service with shorter but weekly broadcasts. Meantime, six co-productions with SRI continue (ICRC via Maryanne Kehoe, GA)

SRI cannot manage a DX program in English, but can in Spanish, 2nd & 4th Weds 2345, Thu 0145, 0245 (*Conexión*) Last two on 6135, 9885, Brasil 5888, Guiana 9905 (gh)

THAILAND R. Thailand, English to us at 0030-0100 back on same frequency as last summer via VOA Udorn, 15370, fair to good (Jim Moats, OH, W.O.R.) Or absent; highly variable over polar path; should use Delano or Greenville (gh, OK)

Foundation stone for new BBC relay in middle of Thailand was laid in mid-May. Cost is 30 megapounds, 4 x 250 kW SW with 13 directional antennas; trials start in autumn 1996, target date March 1997; to compensate for possible loss of Hong Kong and augment Singapore relay. Is in poor area with swampland; locals will get construction jobs and five deep wells, reservoir will provide clear water for first time (BBC *Waveguide*)

UKOGBANI BBC offers free sample of *BBC Worldwide* including *London Calling* programme previews for all streams, at 1-800-875-2997 (*DX Listening Digest*) Mailbag program has new simplified E-mail address: writeon@bbc.co.uk, and program schedules are available on Internet; however, some other shows still announce old address with that nasty demon in them (gh)

UKRAINE RUI transmitters mix into strong spurs: before 1800, 15005 is a mix of 15265 and 15135; at 2100, 11950 and 11780 mix on 11610 blocking AWR Slovakia which should move to 11615 (Kevin Hecht, PA) 15135 and 15265 also mix on 15395 (Wolfgang Büschel, Germany)

UNITED ARAB EMIRATES Abu Dhabi J-95 in English at 2200-2400 on new 13605, 11885, best on 11970 (Kevin Hecht, PA, W.O.R.)

URUGUAY SW situation here: It is hoped new director of SODRE will resume external service. On 6125, **CXA4** relays **CX38**, **R. Educativa** SODRE, 1000-0500, less than 500 watts, antenna aimed at Buenos Aires, nearly N/S. On 6010 LSB, **CXA5**, 150 watts is inactive after brief usage in May 1994 to the Artigas Military Base in Antarctica. On 9515, **CXA68**, former Sarandí and external SODRE channel has long been inactive; might move 9620 transmitter here, but 9515 occupied by Brazilian. 9620, **CXA6** off the air as of March 1995 due to installation of new MW 1050 transmitter at same site; has dipole, used to relay CX6, 500 watts, may resume. On 15275, **CXA14** inactive due to broken antenna, had been used southern summers to relay **CX26** to Antarctica, plans to resume. Is constructing small transmitter for 25m where are assigned **CXA71** on 11885, **CXA10** on 11900, to start on one of them in second half of 1995; used to be 10 kW external service. 60-mb SW feeders: 4900, **R. Sarandí** has 300-watt mobile, but not used anymore for football pickups, cellular phone feed instead. 4970, **R. Cristal** not used for 8 years to pick up cycling events, phone line, VHF or 11735 instead. 4970, **R. Maldonado** still uses this AM feeder for summer cycling event (Horacio A. Nigro, *Relámpago DX* via *Radio Nuevo Mundo*)



USA WEWN continues to be a bad neighbor to US SW listeners and other stations. Despite long usage by China/Mali at 0300, WEWN blocks it on 11715; around 1500, WEWN on 11875 overpowers with splash the only BBC frequency from Antigua to us, 11865 (gh) In April dropped 6000 to use 7425 24 hours to North America (Jim Moats, OH) Congrats to KJES, New Mexico, measured back on proper frequency 15385.0 at 1800, 2000 (gh)

WSHB, Monitor Radio International, J-95 subject to change: 1600-1700 on 17510; 1800-2000 on 17510, 15665; 2000-2100 on 15665, 13770; 2200-2400 on 13770, 17555; 0000-0200 9430, 7535; 0200-0400 5850, 9430; 0400 on 7535, 9840; 0500-0900 on 7535; 0900 on 7535, 7395; 1000-1200 on 6095, 7395; 1200-1400 on 6095, 9455; 1400-1600 break. See also SAIPAN (WSHB) For background on Christian Science, see the April *Atlantic Monthly* (via David Cole, GA)

WVHA, Prophecy Countdown, made an unexpected revision May 13 to the J-95 schedule on p. 52, June *MT*. Basically 9852.5 is shown 7 days a week at 2200-0200, and certain days after 0200 on 7465. Saturdays, 0600-0800 on 7455, 0900-1000 on 9870, 1200-1500 on 11695, 1500-1700 on 15665, 1700-2200 on 13720. (WVHA) *DXtra* confirmed at times given last month, but said would try 15745 Tue after first Mon at 1815 to determine if better than 13720 at 1800. Gordon Simkin keeps offering to "find the rest of incomplete news stories" upon listener requests. What in the world is he talking about? (gh)

KGEI may come back in Twin Falls, ID, but as of May no such construction permit had been requested from the FCC (Adrian Peterson, *Radio News Bulletin*)

Dr. Gene Scott found on new 9975 before and after 0600, no legal ID on hour, but seems KVOH ex-9785, as a satellite-hop ahead of WWCR and KAIJ (gh) It is KVOH, as early as 0100 with jamming (Kevin Hecht, PA) KAIJ was missing following severe storms in Dallas; a few days later only one transmitter was back (Jim Moats, George Thurman)

"Wormy" WRMI, 9955 seems to revise schedule every month; May version showed *Wavescan* Sat 2345, Sun 1130, Mon 0000, next Sat 2200; weekend repeats of *Viva Miami* in English Sat 2100, 2230 (except first week of month), Sun 1330, 2200 (via Gayle Van Horn, George Thurman)

On WWCR, the agreed-upon "DX program" by Al Weiner turned out to be—what else?—overtly *Radio New York International*, UT Mons 0400-0500 on 7435, hosted twice a month by Johnny Lightning, anathema to preacher clients; selling videotapes of *Fury* busted project, and new address of 97 High St., Kennebunk, ME 04030 (gh) Due to interference complaints on 5065 from fishing boats in the Maritimes, WWCR shifted to 5075, but only at 1055-1400 during Brother Stair, unfortunately conflicting with CARACOL-Bogotá until fade at 1130 (gh)

World of Radio may be gone from Sun 0500 on WWCR 7435; on WHRI, 13760, Fri 2229 replaces 2001; Sat 0501 may move from 7315 to 5745 if frequencies are swamped with VOA; Sat 1629, not 1529 on 15105, not 13760, but looking for a new 15 MHz channel to escape Moscow; during summer, KWHR, 17510, propagates into N. America Mon 0330 (gh)

VIETNAM [non] VOV relay via Russia in English to us at 0400-0600 stayed on 7360 in May despite expanding daylight and early fade-outs (Kevin Hecht, PA) Spanish at 0600-0700 moved up in April to 9520 (Olle Alm, Sweden, RNMN)

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



Caracol's "more company" motto was not an invitation to share the frequency.

Broadcast Loggings

Gayle Van Horn



- 0002 UTC on 9646
ITALY: RAI. Light classical music to announcer's English/Italian language mix. (Gerry Le Strange, East Brunswick, NJ) Audible on 9575 at 1935. News item that Italy's GNP has grown by 2%, better than the U.S. or Japan. (Bob Fraser, Cohasset, MA; Gerald R. Brookman, Kenai, AK)
- 0010 UTC on 6185
MEXICO: Radio Educación. Spanish. Closing items of national news. Station ID to cultural programming. (GVH/NC)
- 0054 UTC on 4955
COLOMBIA: Radio Nacional. Spanish. Accordion music (overmodulated) to announcer updates and station promos. (Maywoods DX Team, Maywoods, KY; Ed Shaw, Dr. Joel Roitman, Jim McClure, Dr. Jerry Lineback, Oliver Brewer, John Hafendorfer, Loy Lee)
- 0110 UTC on 9905
SWITZERLAND: Swiss Radio Int'l. National news and features, heard also this frequency 0400-0500. (Turner, IL) Station sign-on with interval signal and ID at 0029 on 9840. (Brookman, AK; Frank Hillon, Charleston, SC)
- 0130 UTC on 9570
PORTUGAL: Radio Portugal Int'l. News and feature on touring the Madeira Islands. (Claude Turner, Chicago, IL)
- 0131 UTC on 6260
GREECE: Voice of Greece. Greek. National news to world headlines. // 7448. (Harold Frodge, Midland, MI)
- 0141 UTC on 6280
JAPAN: Radio Japan. Japanese/English programming mix with fair 222 signal quality. (Frodge, MI) Japanese music and announcer's chatter. Time plps, ID and English news at 0500. (Jerry Witham, Keauau, HI) *Media Roundup* heard on 11705 at 1425-1450. (Turner, IL; Brookman, AK)
- 0230 UTC on 9745
ECUADOR: HCJB. *Blues, Rags, and All That Jazz* hosted by Bill Rapley; music primarily from the pre-rock era. Additional monitoring on 6205 at 0700-0830; 15115 at 1100-1430. (Turner, IL)
- 0230 UTC on 4755
BRAZIL: *Radio Educacao Rural*. Portuguese. Group pop vocals to announcer's chat. Brazil's *Radio Aparecida* heard on 5035 at 2308, with Brazilian ballads and local commercials. (Maywoods DX Team, KY)
- 0258 UTC on 7200
SUDAN: Sudan Radio. Arabic. Interval signal to anthem and station ID. Holy Koran readings to Arabic music. (Tommy Patterson, Mobile, AL)
- 0356 UTC on 7110
ETHIOPIA: Radio Ethiopia. Station sign-on at tune-in. National anthem to clear ID. Brief news items noted with VOA interference. (Maywoods DX Team, KY)
- 0400 UTC on 5990
GERMANY: Deutsche Welle. ID and national newscast, followed by *Africa Highlights* prog. (Witham, HI) DW audible on 15205 at 1103-1150, 15135 at 2100-2150. (Turner, IL)
- 0420 UTC on 6000
SOUTH AFRICA: Channel Africa. Report on Nelson Mandela's success in uniting both liberal and conservative parties toward achieving the goals of the nation's people. Weak signal quality. (Witham, HI; Brookman, AK) Heard at 1650 on 15240. (Maywoods DX Team, KY) Station noted in Afrikaans at 0430 UTC on 6161715 on 4945, with Sunday service. (Witham, HI)
- 0525 UTC on 6165
NETHERLANDS: Radio Netherlands. // 9590 with documentaries and arts programs. Additional monitoring at 2330-0030 on 6020//6165//9840. (Turner, IL; Brookman, AK)
- 0530 UTC on 6015
AUSTRIA: Radio Austria Int'l. *Report From Austria* on general features and current affairs. (Turner, IL; Brookman, AK)
- 0700 UTC on 9700
NEW ZEALAND: Radio New Zealand Int'l. Classical music prog. (Turner, IL) Religious programming with text and hymns monitored on 9700 at 0925. (J. Dennison, Atlanta, GA)
- 0900 UTC on 3315
PAPUA NEW GUINEA: (Admiralty Islands) Radio Manus. Newscast, station ID. Announcer's talk in English to pop music show. (Maywoods DX Team, KY)
- 1000 UTC on 4890
PAPUANEW GUINEA: NBC. National newscast to local Pt. Moresby time check. Weather check and pop music intros by announcer. (Dennison, GA)
- 1004 UTC on 4775
PERU: *Radio Tarma*. Spanish. Andean music tunes to solid ID. Female duet by flutes and harp instrument. Peru's *Radio Oriente* heard on 6188 at 1130. (Maywoods DX Team, KY)
- 1018 UTC on 7160
MALAYSIA: Radio Malaysia. English news, and editorial on *Maintaining Our Credibility in the World*. (Maywoods DX Team, KY)
- 1040 UTC on 11690
PHILIPPINES: FEBC. English to Australia with gospel and praise of "holy spirit is within us all." (Maywoods DX Team, KY)
- 1049 UTC on 11835
SRI LANKA: SLBC Corp. News and ID in English by male announcer. *Hour of Decision* program at 1100. (Maywoods DX Team, KY)
- 1100 UTC on 9530
SINGAPORE: Radio Singapore Int'l. Announcer's sign-on identification. Frequency quote to program preview. News topics to pop music vocals. (Tom Banks, Dallas, TX) Station audible past 1210 on 9530. (Maywoods DX Team, KY)
- 1130 UTC on 11900
FINLAND: Radio Finland. *Compass North* program heard 1130-1156. Item on American football monitored 1248-1254. (Turner, IL) Heard on 15400 at 1337. (Brookman, AK)
- 1130 UTC on 9580
AUSTRALIA: Radio Australia. Report on charting ancient river systems. // 9860. Additional monitoring on 11800 at 1240. (Fraser, MA; Brookman, AK)
- 1141 UTC on 4725
MYANMAR: *Radio Myanmar*. Regional language with talk and Asian music. *Defense Forces BC* noted on 6570 at 1152. (Maywoods DX Team, KY)
- 1158 UTC on 15445
BRAZIL: Radiobras. Sign-on routine with ID, followed by *Brazilian Panorama* program. (Turner, IL)
- 1230 UTC on 15530
FRANCE: Radio France Int'l. Report on a drive-in church. (Fraser, MA) // 13625 1200-1300. (Turner, IL; Brookman, AK)
- 1300 UTC on 17780
RUSSIA: Voice of Russia. Program features and "VOR" ID. This frequency monitored to 1500. *Music and Musicians* heard on 15105 at 1500. (Turner, IL)
- 1315 UTC on 11850
NORWAY: Radio Norway Int'l. Movie *Fog* discussed as a cult film. (Fraser, MA) Norwegian at 2201 on 9485. (Turner, IL)
- 1320 UTC on 15070
UNITED KINGDOM: BBC. *Newshour* on new Russian security forces may be old KGB under a new name. (Fraser, MA; Brookman, AK)
- 1411 UTC on 13670
BELGIUM: Radio Vlaanderen. English feature on the privatization of Post, and comments on women's issues. (Maywoods DX Team, KY)
- 1430 UTC on 9470
PAKISTAN: Radio Pakistan. Very poor signal quality on // 13590 in Urdu. Regional music and talk. Station heard on 4895.7 at 1720, with duo's news topics. (Witham, HI)
- 1645 UTC on 4965
ZAMBIA: The Christian Voice. *A Short Visit to Swaziland* program. Feature included a brief history of the people, their customs, followed by a radio tour. Station identification at 0700. Station ID noted with talk and music on 6065 at 1735. (Witham, HI)
- 1650 UTC on 9780
YEMEN: Republic of Yemen Radio. Arabic. Male monologue to music interludes. Regional Arabic music at 1654 to march music at 1700. National newscast at the hour. (Witham, HI)
- 1650 UTC on 4845
MAURITANIA: RTV Mauritania. Arabic. Regional music to Islamic prayers. Anthem to 1700*. (Witham, HI) Arabic programming from 4845 at 2220. Holy Koran at 2230. (Maywoods DX Team, KY)
- 1700 UTC on 15435
LIBYA: Radio Jamahiriya. Arabic. Interval signal to station identification. Lively march music to Arabic tune. Announcer's presumed program review. (Maywoods DX Team, KY)
- 1715 UTC 9810
SEYCHELLES: FEBA. Assumed Somali. Vocals accompanied by hammered-string instrument. "Radio FEBA" ID, interval signal and 1730*. Former // 11800 not heard. (Witham, HI)
- 1715 UTC on 5320
CHINA: CPBS. Chinese. Mournful Chinese music played on a wooden flute instrument. Brief announcements to anthem sign-off at 1730. (Witham, HI)
- 1725 UTC on 9685
INDIA: All India Radio. Indian music to ID and news at 1730. News repeated in unidentified language at 1735. Sign-off at 1740. (Witham, HI)
- 1835 UTC on 17605
NETHERLANDS ANTILLES: Radio Netherlands Bonaire relay. *50 Plus* program with Pete Myers. Interviews with allied veterans who helped liberate the Netherlands in 1945. (Fraser, MA; Brookman, AK)
- 1930 UTC on 11720
BULGARIA: Radio Bulgaria. *Folk Studio* program on spring festivals. (Fraser, MA) Bulgarian music at 2145 on 11720// 9700, with co-channel interference. (John Hanz, Old Bridge, NJ; Brookman, AK) Jazz music show circa 1953 heard at 1930 broadcast on 9700. (Maywoods DX Team, KY)
- 2020 UTC on 11620
INDIA: All India Radio. Hindu. Radio play of two women. (Fraser, MA; Brookman, AK)
- 2030 UTC on 9022
IRAN: VOIRI. Arabic. Islamic call to prayer preceded by frequency quote. (Maywoods DX Team, KY)
- 2100 UTC on 11940
ROMANIA: Radio Romania Int'l. Romanian news and reports heard on // 9690. (Hanz, NJ)
- 2100 UTC on 7385
COSTA RICA: Radio for Peace Int'l. *Glenn Hauser's World of Radio* program. RPI audible on 15050 at 2100-2300. (Turner, IL; Brookman, AK)
- 2130 UTC on 11705
CUBA: Radio Havana. Cuban national news into *Our Viewpoint* program. (Hanz, NJ) Monitored on 9820, 0500-0700, and 0100-0600 on 6000. (Turner, IL; Brookman, AK)
- 2135 UTC on 9840
KUWAIT: Radio Kuwait. Arabic. Regional music vocals to Holy Koran readings. (Don Taylor, Green Cove Springs, GA)
- 2152 UTC on 4760
LIBERIA: ELWA. English station ID to religious format of text and hymns. (Maywoods DX Team, KY)
- 2200 UTC on 9445
TURKEY: Voice of Turkey. Report on the Istanbul Film Festival. (Fraser, MA; Turner, IL; Brookman, AK)
- 2205 UTC on 4915
GHANA: Ghana BC Corp. English newscast with items on Winnie Mandela. National government news to ID. (Maywoods DX Team, KY)
- 2220 UTC on 5020
NIGER: La Voz du Sahel. French. Regional style music to pop vocals. Male announcer's chat and featured program. (Banks, TX)
- 2300 UTC on 7370
CROATIA: Croatian Radio. Report on troop withdrawal and civilian interviews. Ten minute newscast on the hour, monitored at 0000, 0100, 0200, 0300 // 5895. (Hanz, NJ)
- 2330 UTC on 5975
CANADA: BBC World Service relay. *Seeing Stars* on stargazing in New Zealand for distant asteroids. (Fraser, MA)

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

Surf's Up!

Hold on, dudes and dudettes...before you grab your board in search of the big wave, I'm talking transmitter surfing!

Ask any DXer what one of the quickest and perhaps easiest methods of QSLing is, and chances are, logging transmitter sites will be among them. A look through the monthly SWBC Loggings and QSL Report will point up the numerous listings for transmitter sites (or relay sites) for many of the international broadcasters.

Forexample, Radio Netherlands can be counted once for each transmitter site verified, which would include Netherlands, Netherlands Antilles-Bonaire, and Madagascar. For Voice of America sites, add Ascension Islands, Botswana, Greece, Morocco, and others. Don't forget Cana-

dian sites which relay Radio Korea, and Radio Japan; Radio China International has sites in French Guiana, Mali, Spain, and Switzerland.

Most stations will list the site on the QSL card if requested. Normally, reports should be directed to the station's main office rather than the transmitter site. However, sometimes reporting to the site will get you around a "no-site" QSL policy dictated by the home office. If you choose to send your report to the direct site, a prepared QSL card enclosed with your detailed report is a good idea.

Stations such as BBC and Deutsche Welle issue site cards only rarely, or on a limited time basis. Here again, include a prepared QSL card with your report to the engineer-in-charge at the site, and return postage or IRCs might also improve your reply chances.

For additional information on transmitter



This full detail Radio Japan QSL verifies the column editor's reception of their Skelton, UK, relay.

BULGARIA

Radio Bulgaria, 11720 kHz. Full data QSL (in a series of 6) unsigned. Schedule and info letter on report awards program. Station address: 4 Dragan Tsankov Blvd., 1040 Sofia, Bulgaria. (Paul Jablonowski, Greenfield, WI)

CANADA

CBC, 9625 kHz. Full data verification letter signed by Nathalie Chamberland. Received in 164 days for a taped English report. Station address: c/o CBC North-Quebec, Box 6000, Montreal, QUE H3C 3A8 Canada. (Walter Szczepaniak, Philadelphia, PA)

CROATIA

Hrvatska Radio, 5950/5895 kHz. Full data "Austrian DX Club Contest" cards (one for each frequency). Received in 368 days for an English report sent through the Austrian DX Club. Received from station's address as: Hrvatska Radiotelevizija, Prinsavlje 3, 4100 Zagreb, Croatia. (Charlie Washburn, North Perry, ME)

FRENCH GUIANA

Radio Japan relay, 11895 kHz. Full data QSL card signed by H. Kawamoto. Received in 40 days for an English report (used on a Radio Japan report form). Station address: NHK, Tokyo 150-01 Japan. (Randy Stewart, Springfield, MO)

INDIA AIR

(All India Radio) via Madras, 4920 kHz. Full data "bridge" card signed by S.C. Panda-Audience Research Officer. Full data letter, brochures, sticker, and schedule enclosed. Received in 124 days for an English report. Station address: c/o External Services Division, P.O. Box 500, New Delhi 110 001, India. (Washburn, ME)

MEDIUM WAVE

WIFI, 1460-AM kHz. Verification on station letterhead, signed by Michael Venditti-Operations Director. Received in 13 days for a taped English AM report, address label (used on reply)

and mint stamps. Station's address: 2025 Burlington-Columbus Rd., Florence, NJ 08016. (Szczepaniak, PA)

WPWA, 1590-AM kHz. Verification on station letterhead, signed by Andrew Shearer-Operating Director. Received in 20 days for a taped English AM report, address label (used on reply) and mint stamps. Station address: 12 Kent Rd., Aston, PA 19014. (Szczepaniak, PA)

WTIC, 1080-AM kHz. Full data letter signed by Charles Dube-Broadcast Technologist. Received in 13 days for a taped English AM report, address label (used on reply) and mint stamps (used on reply). Station address: 1 Financial Plaza, Hartford, CT 06103. (Szczepaniak, PA)

WNJC, 1360-AM kHz. Returned my reception report signed by Augustine M. Cawley-Notary Public of New Jersey, stamped with NJ seal. Received in 10 days for a taped English AM report, address label (used on reply) and mint stamps (used on reply). Station address: Box 5500 Deptford, Vineland, NJ 08096. (Szczepaniak, PA)

MOLDOVA

Radio Dniester International, 11750 kHz. Full data *Verification Certificate*, signed by A. Komar-Chief Editor. Postcards and personal letter enclosed. Received in 156 days for an English report, 1 IRC, address label (used on reply). Station address: 25th October St., 45 Tiraspol Transdnistria, CIS 278000. (Hardester, NC)

NORWAY

Radio Denmark relay 15335 kHz. No data map card unsigned and form letter. Received in 60 days for an English report. Station address: Danmarks Radio, DK-1999 Frederiksberg C, Denmark, (Washburn, ME)

SHIP TRAFFIC

Imperial Sr. Clair-VGFG, 2182 kHz USB (Tanker). Full data prepared QSL card verified. Received in 26 days for an English utility report and one U.S.

dollar. Ship QSL address: c/o Imperial Oil Co., Ltd., 111 Clair St.-West, Toronto, ONT M5W 1K3 Canada. (Hank Holbrook, Dunkirk, MD)

Irving Eskimo-VCRJ, 2182/2237 kHz USB (Oil Tanker). Full data prepared QSL card verified and brochure of vessel. Received in 35 days for an English utility report and one U.S. dollar. Ship QSL address: c/o Kent Line Limited, Motor Vessel Owners & Agents, P.O. Box 72, Saint John, NB E2L 4B4 Canada. (Holbrook, MD)

Coronado-KPSB, 500 kHz USB (Tanker). Full data prepared QSL card verified. Received in 8 days for an English utility report and mint stamps. Ship QSL address: c/o Keystone Shipping Co., 313 Chestnut St., Philadelphia, PA 19106. (Holbrook, MD)

SPAIN

China Radio International, 9690 kHz. Full data "dove/globe" card, unsigned. Station sticker and schedule enclosed. Received in 47 days for an English report. Station address: No.2 Fuxingmenwai, Beijing 100866 Peoples Republic of China. (Washburn, ME)

SOUTH KOREA

Radio Korea, 9650 kHz. Full data "600th Anniversary of Seoul" card, unsigned. Received in 36 days for an English report. Station address: c/o Korean Broadcasting System, Yoido-Dong 18, Young Deung Po-Gu, Seoul, Korea. (Washburn, ME)

ST. HELENA

Radio St. Helena, 11092.5 kHz USB. Full data station logo/map card signed by Tony Leo. Station info sheet enclosed. Received in 137 days for an English report of '94 special transmission day, one U.S. dollar, and address label (used on reply). Station address: c/o The Castle, Jamestown, St. Helena, South Atlantic Ocean. (Hardester, NC; Leslie Edwards, Doylestown, PA) Sorry, folks...next broadcast is in 1996!

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 "Newswire" 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 "v" (various languages).

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

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

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

Consult the propagation charts. To further help you find the right frequency, we've included 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

More SWBC compiled by Glenn Hauser

Since talks with the Liberation Tigers of Tamil Eelam broke down, the Sri Lankan government started a **new unnamed Tamil service** at *1315-1500 on 6035 kHz, presumably the same 12.5 kW transmitter at Puttalam formerly used by TWR. Meanwhile, LTTE is no longer on SW, just FM from Jaffna, inaudible in Colombo, reports Victor Goonetilleke on RN Media Network. Radio Norway posted schedule on USENET, via George Thurman, showing Burmese at 1400-1500 on 13800, 2400-0100 on 7315, but Finn Krone via Wolfgang Büschel confirms **Democratic Voice of Burma** at 1430 instead of 7315, though the higher frequency would be better in summer; mistake?

Radio Moldova International, via Romania, went to new 11580 for English at 1400 and 1930, good strength, but variable audio, reports John Stewart in BDXC Communication.

Former Yugoslavia developments: **Sarajevo** can sometimes be heard on 7108v USB, but mail is dysfunctional; fax tech manager

Mr. N. Dizdarevic instead at 387-71-645-142, per *Play-DX* via RN Media Network.

Croatian Radio, Zagreb added new 10-minute English newscasts to us at 0200 and 0300 on 5895, reports Randy Stewart, MO. BBCM says also on 7370, at least hourly from 0000 through 0400, instead of just simulcasting domestic service overnight. On RNMN, Andy Sennitt corrects info in his 1995 *WRTVH* for this station: E-mail to hrt.com.hr; fax the technical dept. at 385-1-663347, phone 663355.

R. Yugoslavia's revived high-power transmitters at Bijeljina, Bosnia, moved to 9580 and 11870 for summer English to us at 0000, 0430, as noted by Kevin Hecht.

R. Burundi, 6140, QSLed for Ed Rausch, says HCJB *The Latest Catch*, heard at 0300-0345, saying it's 50 kW and a log-periodic; he sent \$2 + stamps, and the excellent French reply came from Girard Mfuranzima. BBCM updates info on p. 62, June *MT* about V. of the Tigray Revolution—0400-0500 on

7515 and unconfirmed 6770; 1500-1600 on 7515 and 6770 confirmed.

We round up bits and pieces on monitoring Iraq: **Baghdad** can be surprisingly good on 17740 from 0600; tho jamming deteriorates it by 0900, it closes after 1600; 13652 was heard around 0900-1100, says BBCM. In DSWCI *SW News*, Godfrey Clemitson, RSA, heard Baghdad on 13672, best on LSB, in Arabic 1640-1652. Wolfgang Büschel, Germany, says 15133 at 1800-2300 sounds like 10 to 30 kW,

BBCM also reports: **V. of Iraqi Kurdistan**, 4183v, is confirmed with an extended schedule for a service to Europe at 1830-1910*, mostly repeating Kurdish and Arabic broadcasts earlier in the evening from 1700; also still at *0245 and *0930. **V. of Iranian Kordestan** was back on 4160 after a 5-week absence, at 1430-1530 in Kurdish and Persian.

On RVI *Radio World* via Diane Mauer, Eugene Gebreus monitored English from Iran: 1130 on 11745, 11930, 11875, 11790; 1530 on 11875, 11790; 1930 on 9022, 7260; 2130 on 9630; 0030 on 9022, 9670, 7260. But Brian Alexander, PA, found 6175 ex-9670, despite BBC and Portugal.

R. Huayacocotla, México, put off 2390 as reported here last month, toured area communities distributing tapes about why they were gone and collected petitions. Support from abroad is very helpful, if people will fax Lic. Carlos Ruiz Sacristán, Secretario de Comunicaciones y Transportes, at +(52 5) 519-0692, according to USENET postings from the station via Pete Costello.



**RADIO YUGOSLAVIA
MY BEST FRIEND**

in Arabic, replacing 11748.7. On April 27, the Saudi newspaper Al-Jazirah reported anti-Saddam resistance destroyed a jamming station at Khan Bani Sa'd, which had just been built in February by Serbian experts, but there are 14 jamming stations in Iraq, including Iraqi Radio SW sites in Salman Pak and Abu Gharib, to keep Iraqi people from hearing opposition or outside voices; this from BBCM.

MT Monitoring Team

Gayle Van Horn, Frequency Manager

North Carolina

Dave Datko

California

Next Reporting Deadline

July 19, 1995

Jim Frimmel, Program Manager

Texas

Jacques d'Avignon

Propagation Forecasts

Ontario, Canada

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 (am) (Newsdesk)
 BBC (as pac) (Newsdesk)
 BBC (south as)
 Canada (North-Quebec)
 China Radio Int'l
 Monitor Radio Int'l [T-A]
 Radio Australia
 Radio New Zealand Int'l
 Radio Prague
 Radio Thailand
 Radio Ukraine Int'l
 Radio Yugoslavia
 Spanish National Radio
 Voice of America (am)
 Voice of America (as)
 Voice of America (ca)
 Voice of Russia
 Radio Pyongyang
 0010
 China Radio Int'l*
 Voice of America (ca) [T-A]*
 0015
 Radio Cairo
 0030
 All India Radio
 Radio Nacional de Venezuela [T-S]
 Radio Netherlands Int'l
 Radio New Zealand Int'l [M-F]
 Radio Sweden [T-A]
 Radio Thailand [T-S]
 Voice of America (am) [T-S]
 (Special English)
 Voice of America (as) (Special English)
 Voice of Russia
 0045
 BBC (am)*
 BBC (south as)*
 0050
 RAI Italy

0100 UTC

(9:00 PM EDT, 6:00 PM PDT)

BBC (am) (Newsdesk)
 BBC (as pac)
 BBC (south as) (Newsdesk)
 Canada (North-Quebec) [S]
 Deutsche Welle
 FEBC (Philippines)
 HCJB
 KVOH [W]
 Monitor Radio Int'l [T-A]
 R Slovakia Int'l [A]*
 R Slovakia Int'l [S/T-F]
 Radio Australia
 Radio Budapest
 Radio Canada Int'l
 Radio Havana Cuba [T-S]
 Radio Japan

Radio Korea
 Radio New Zealand Int'l
 Radio Norway Int'l [M]
 Radio Prague
 Spanish National Radio
 Swiss Radio Int'l
 Voice of America (am)
 Voice of America (as)
 Voice of America (ca)
 Voice of Indonesia
 Voice of Russia
 0110
 Radio Australia [M-F]*
 0113
 Radio Havana Cuba [T-S]*
 0130
 Radio Austria Int'l
 Radio Havana Cuba [T-S]
 Radio Netherlands Int'l
 Radio Portugal Int'l [T-A]
 Radio Sweden [T-A]
 Voice of Greece
 Voice of Russia [T-A]
 0145
 Radio Tirana
 0152
 Vatican Radio [S]
 0155
 Radio Canada Int'l [T-A]
 Vatican Radio [W/F]
 Voice of Indonesia

0200 UTC

(10:00 PM EDT, 7:00 PM PDT)

BBC (am) (Newsday)
 BBC (as pac) (Newsday)
 BBC (eu) (Newsday)
 BBC (south as) (Newsday)
 Canada (North-Quebec)
 Deutsche Welle
 Monitor Radio Int'l [T-A]
 Radio Australia
 Radio Canada Int'l
 Radio Havana Cuba [T-S]
 Radio New Zealand Int'l [M-A]
 Radio Romania Int'l
 RAE Argentina [T-A]
 Voice of America (as)
 Voice of Myanmar (Burma)
 Voice of Russia
 WINB [T-A]
 WWCR #3 [T-A]
 0203
 Voice of Free China
 0213
 Radio Havana Cuba [T-S]*
 0215
 Radio Cairo
 Radio Nepal
 0230
 Radio Austria Int'l
 Radio Budapest

Radio Havana Cuba [T-S]
 Radio Netherlands Int'l
 Radio Pakistan
 Radio Sweden [T-A]
 Radio Tirana
 Voice of Russia

0300 UTC

(11:00 PM EDT, 8:00 PM PDT)

BBC (af)
 BBC (am)
 BBC (as pac)
 BBC (eu) [S-F]
 BBC (south as)
 Canada (North-Quebec)
 Channel Africa
 China Radio Int'l
 Deutsche Welle
 Monitor Radio Int'l [T-F]
 Radio Australia
 Radio Bulgaria
 Radio Canada Int'l
 Radio Havana Cuba [T-S]
 Radio New Zealand Int'l [A]
 Radio New Zealand Int'l [M-F]*
 Radio Norway Int'l [S]
 Radio Romania Int'l
 Radio Tanzania
 Swiss Radio Int'l
 Voice of America (af)
 Voice of America (me)
 Voice of Israel
 Voice of Russia
 WWCR #1 [T-A]
 ZBC Zimbabwe
 0403
 Radio Pyongyang
 0410
 China Radio Int'l*
 0413
 Radio Havana Cuba [T-S]*
 0425
 RAI Italy
 0430
 BBC (af)*
 BBC (eu) [A]
 Radio Finland
 Radio Havana Cuba [T-S]
 Radio Netherlands Int'l
 Radio Yugoslavia
 Voice of Russia
 0431
 Voice of America (af) [M-F]*

Radio Japan [W-M]

0400 UTC

(12:00 AM EDT, 9:00 PM PDT)

BBC (af) (Newsdesk)
 BBC (am) (Newsdesk)
 BBC (as pac)
 BBC (eu) [S-F] (Newsdesk)
 BBC (south as) (Newsdesk)
 Canada (North-Quebec)
 Channel Africa
 China Radio Int'l
 Deutsche Welle
 Monitor Radio Int'l [T-F]
 Radio Australia
 Radio Bulgaria
 Radio Canada Int'l
 Radio Havana Cuba [T-S]
 Radio New Zealand Int'l [A]
 Radio New Zealand Int'l [M-F]*
 Radio Norway Int'l [S]
 Radio Romania Int'l
 Radio Tanzania
 Swiss Radio Int'l
 Voice of America (af)
 Voice of America (me)
 Voice of Israel
 Voice of Russia
 WWCR #1 [T-A]
 ZBC Zimbabwe
 0403
 Radio Pyongyang
 0410
 China Radio Int'l*
 0413
 Radio Havana Cuba [T-S]*
 0425
 RAI Italy
 0430
 BBC (af)*
 BBC (eu) [A]
 Radio Finland
 Radio Havana Cuba [T-S]
 Radio Netherlands Int'l
 Radio Yugoslavia
 Voice of Russia
 0431
 Voice of America (af) [M-F]*

0500 UTC

(1:00 AM EDT, 10:00 PM PDT)

BBC (af) (Newsday)
 BBC (am) (Newsday)
 BBC (as pac) (Newsday)
 BBC (eu) (Newsday)
 BBC (south as)
 Canada (North-Quebec)
 Channel Africa
 China Radio Int'l
 Deutsche Welle
 HCJB
 Monitor Radio Int'l [T-F]

Radio Australia
 Radio Cameroon
 Radio Canada Int'l [M-F]
 Radio Havana Cuba [T-S]
 Radio Japan
 Radio New Zealand Int'l [S-F]
 Spanish National Radio
 Swiss Radio Int'l (eu)
 Vatican Radio [T/F]
 Voice of America (af)
 Voice of America (me)
 Voice of Russia
 WWCR #1 [M-F]
 0510
 China Radio Int'l*
 Radio Australia [M-F]*
 0513
 Radio Havana Cuba [T-S]*
 0530
 BBC (af)*
 Radio Austria Int'l
 Radio Havana Cuba [T-S]
 Radio Romania Int'l
 Voice of Nigeria
 Voice of Russia
 0555
 Radio Japan [A]

0600 UTC

(2:00 AM EDT, 11:00 PM PDT)

BBC (af)
 BBC (am)
 BBC (as pac)
 BBC (eu)
 BBC (south as)
 Deutsche Welle
 Monitor Radio Int'l [T-F]
 Radio Australia
 Radio Havana Cuba [T-S]
 Radio Japan
 Radio Korea
 Radio New Zealand Int'l [M-A]
 Radio Norway Int'l [S]
 Radio Prague
 Radio Yemen
 Swiss Radio Int'l
 Swiss Radio Int'l (eu)
 Voice of America (af) [A-S]
 Voice of America (me)
 Voice of Kenya
 Voice of Malaysia
 Voice of Russia
 WWCR #1 [M/H]
 WWCR #3 [S]
 0601
 Voice of America (af) [M-F]*
 0603
 Radio Pyongyang
 0613
 Radio Havana Cuba [T-S]*
 0630
 BBC (af)*

Radio Austria Int'l [T-S]
 Radio Havana Cuba [T-S]
 Radio Vlaanderen Int'l
 Radio Yemen
 Vatican Radio [H]
 Voice of Nigeria [M-F]
 Voice of Russia
 0632
 Radio Romania Int'l
 0645
 Radio Finland
 Radio Romania Int'l
 Voice of Nigeria [M-F]*
 0655
 Radio Japan [W-M]
 Voice of Med. (Malta) [M-F]
 0657
 AWR Latin America [F]*

0700 UTC
(3:00 AM EDT, 12:00 AM PDT)

BBC (af)
 BBC (am)
 BBC (as pac)
 BBC (eu)
 BBC (south as)
 Monitor Radio Int'l [T-F]
 Papua New Guinea
 Radio Australia
 Radio Japan
 Radio New Zealand Int'l [A]
 Radio New Zealand Int'l [M-F]*
 Voice of Myanmar (Burma)
 Voice of Russia
 0703
 Radio Pyongyang
 Voice of Free China
 0710
 Radio Australia [M-F]*
 0730
 HCJB
 Radio Austria Int'l [T-S]
 Radio Netherlands Int'l
 Radio Pakistan
 Radio Prague
 Vatican Radio [M-F]
 Voice of Greece [S/H]
 Voice of Russia [M-A]
 0750
 Radio New Zealand Int'l [M-F]*
 Russia (Radio Pacific Ocean)
 [A]
 0755
 Radio Japan
 Voice of Med. (Malta) [M-F]

0800 UTC
(4:00 AM EDT, 1:00 AM PDT)

BBC (af)
 BBC (am)
 BBC (as pac)
 BBC (eu)
 BBC (south as)
 KNLS
 Monitor Radio Int'l [M-A]
 Radio Australia
 Radio Finland
 Radio Korea
 Radio New Zealand Int'l
 Radio Pakistan
 Voice of Indonesia [A-H]
 Voice of Malaysia
 Voice of Russia
 0803
 Radio Pyongyang
 0810
 Radio New Zealand Int'l [M-F]*
 0830
 [S]
 R Slovakia Int'l
 Radio Netherlands Int'l

Voice of Russia
 0855
 Voice of Indonesia [A-H]

0900 UTC
(5:00 AM EDT, 2:00 AM PDT)

BBC (af)
 BBC (am)
 BBC (as pac)
 BBC (eu)
 BBC (south as)
 China Radio Int'l
 Deutsche Welle
 HCJB
 Monitor Radio Int'l [M-A]
 Papua New Guinea [M]*
 Radio Australia
 Radio Japan
 Radio New Zealand Int'l [M-A]
 Radio Vlaanderen Int'l [M-A]
 Swiss Radio Int'l
 Voice of Russia
 WWCR #3 [A]
 0910
 China Radio Int'l*
 Radio Australia [M-F]*
 0920
 Voice of Greece [S/H]
 0930
 [S]
 FEBC (Philippines)
 Radio Austria Int'l [M-A]
 Radio Netherlands Int'l
 Voice of Russia
 0940
 Voice of Greece
 0945
 Deutsche Welle [M-F]*
 0955
 Radio Japan

1000 UTC
(6:00 AM EDT, 3:00 AM PDT)

All India Radio
 BBC (af) (Newsdesk)
 BBC (am) (Newsdesk)
 BBC (as pac) (Newsdesk)
 BBC (eu) (Newsdesk)
 China Radio Int'l
 FEBC (Philippines) [M-F]*
 Monitor Radio Int'l
 Papua New Guinea
 Radio Australia
 Radio New Zealand Int'l [S-F]
 Radio Tanzania
 Swiss Radio Int'l (eu)
 Voice of America (as)
 Voice of America (ca)
 Voice of Israel
 Voice of Kenya
 Voice of Russia
 WYFR (Satellite Network) [M-A]
 1010
 China Radio Int'l*
 Radio New Zealand Int'l [M-F]*
 1020
 Radio New Zealand Int'l [H]*
 Vatican Radio [M-A]
 1030
 Radio Dubai
 Radio Netherlands Int'l
 Radio Prague
 Voice of Nigeria
 Voice of Russia
 WYFR (Satellite Network) [M-F]
 1045
 Voice of Nigeria [A-S]*

1100 UTC
(7:00 AM EDT, 4:00 AM PDT)

BBC (af) (Newsdesk)

BBC (am) (Newsdesk)
 BBC (as pac) (Newsdesk)
 BBC (eu) (Newsdesk)
 BBC (south as) [H-T]
 (Newsdesk)
 Canada (North-Quebec) [A-S]
 Deutsche Welle
 Monitor Radio Int'l [M-A]
 Papua New Guinea
 Radio Australia
 Radio Ghana [A-S]
 Radio Japan
 Radio Jordan
 Radio Mozambique
 Radio New Zealand Int'l
 (Newsdesk)
 Radio Pakistan
 Radio Singapore Int'l
 Swiss Radio Int'l
 Swiss Radio Int'l (eu)
 Voice of America (as)
 Voice of America (ca)
 Voice of Russia
 WHRI [A]
 WWCR #1 [M-F]
 WYFR (Satellite Network) [M-A]
 1103
 Radio Pyongyang
 1110
 Radio Australia*
 1130
 Radio Austria Int'l
 Radio Bulgaria
 Radio Finland [M-F]
 Radio Korea
 Radio Nacional de Venezuela
 [M-A]
 Radio Netherlands Int'l
 Radio Singapore Int'l
 Radio Sweden [M-F]
 Voice of Asia
 Voice of Russia
 WYFR (Satellite Network) [M-A]
 1145
 Deutsche Welle [M-F]*
 1155
 Radio Japan [S-F]

1200 UTC
(8:00 AM EDT, 5:00 AM PDT)

BBC (af) [M-A]
 BBC (am)
 BBC (as pac) [M-A]
 BBC (eu)
 BBC (south as)
 Canada (North-Quebec) [A-S]
 China Radio Int'l
 Monitor Radio Int'l [M-A]
 Papua New Guinea
 Polish Radio [A]
 Polish Radio [M-F]*
 Radio Australia
 Radio Canada Int'l [M-F]
 Radio France Int'l
 Radio New Zealand Int'l [H-T]
 Radio Norway Int'l [S]
 Radio Singapore Int'l
 Radio Tashkent
 Voice of America (as)
 Voice of Russia
 WYFR (Satellite Network) [M-F]
 1203
 Radio Korea
 Voice of Free China
 1204
 HCJB [M-F]
 1210
 China Radio Int'l*
 1215
 BBC (af) [M-A]*
 BBC (eu)*

BBC (south as) [M-A]*
 1230
 HCJB [M-F]*
 Radio Austria Int'l
 Radio Bangladesh [S-M]
 Radio Cairo
 Radio Canada Int'l
 Radio Finland [M-A]
 Radio Netherlands Int'l
 Radio Singapore Int'l
 Radio Sweden [M-F]
 Radio Vlaanderen Int'l [S]
 Voice of Russia [M-A]
 Voice of Turkey
 Voice of Vietnam
 WYFR (Satellite Network) [M-F]
 1231
 Radio France Int'l [T]*
 1240
 Voice of Greece

1300 UTC
(9:00 AM EDT, 6:00 AM PDT)

BBC (af) (Newshour)
 BBC (am) (Newshour)
 BBC (as pac) (Newshour)
 BBC (eu) (Newshour)
 BBC (south as) (Newshour)
 Canada (North-Quebec) [S]
 China Radio Int'l
 KNLS
 Monitor Radio Int'l [M-A]
 Papua New Guinea
 Radio Australia
 Radio Canada Int'l [S]
 Radio Ghana
 Radio Norway Int'l [S]
 Radio Romania Int'l [M-A]
 Radio Singapore Int'l
 Radio Tanzania [A-S]
 Radio Vlaanderen Int'l [M-A]
 Swiss Radio Int'l
 Voice of America (as)
 Voice of Kenya
 Voice of Russia
 WYFR (Satellite Network) [M-F]
 1301
 Radio Romania Int'l [S]
 1303
 Radio Pyongyang
 1310
 China Radio Int'l*
 Radiobrás [M-F]
 1324
 HCJB [M-F]
 1328
 Radio Cairo
 1330
 All India Radio
 FEBC (Philippines)
 Radio Austria Int'l
 Radio Canada Int'l
 Radio Dubai
 Radio Finland
 Radio Netherlands Int'l
 Radio Portugal Int'l [M-F]
 Radio Singapore Int'l
 Radio Sweden [M-F]
 Radio Tashkent
 Voice of America (as) (Special English)
 Voice of Russia
 Voice of Vietnam
 1355
 Radio Singapore Int'l

1400 UTC
(10:00 AM EDT, 7:00 AM PDT)

BBC (af)
 BBC (am)
 BBC (as pac)

BBC (eu)
 BBC (south as)
 Canada (North-Quebec) [A-S]
 China Radio Int'l
 Monitor Radio Int'l [M-A]
 Radio Australia
 Radio Cameroon
 Radio Canada Int'l [S]
 Radio France Int'l
 Radio Ghana
 Radio Japan
 Radio Jordan [A]
 Radio Korea [M-A]
 Voice of America (as)
 Voice of Russia
 WINB [M-F]
 WWCR #1 [M-F]
 WYFR (Satellite Network) [A]
 1410
 China Radio Int'l*
 1415
 Radio Nepal
 1424
 HCJB [M-F]
 1430
 FEBC (Philippines)
 Radio Nacional de Venezuela
 [M-A]
 Radio Netherlands Int'l
 Radio Romania Int'l [T-S]
 RTM Morocco [S]
 Voice of Myanmar (Burma)
 Voice of Russia
 WYFR (Satellite Network) [M-F]
 1431
 Radio France Int'l [T]*
 Radio Romania Int'l [M]
 1440
 FEBC (Philippines) [M-F]*
 1445
 All India Radio
 Voice of Myanmar (Burma)
 1455
 Radio Japan [A]
 Voice of Med. (Malta) [M-F]

1500 UTC
(11:00 AM EDT, 8:00 AM PDT)

BBC (af)
 BBC (am)
 BBC (as pac) [A-S]
 BBC (eu)
 BBC (south as)
 Canada (North-Quebec) [A-S]
 Channel Africa
 China Radio Int'l
 Monitor Radio Int'l [M-A]
 Radio Australia
 Radio Canada Int'l [S]
 Radio Japan
 Radio Jordan
 Radio Omdurman
 Radio Tallinn [M-F]
 Swiss Radio Int'l
 Swiss Radio Int'l (eu)
 Voice of America (as)
 Voice of America (me)
 Voice of Russia
 WINB [M-W/F]
 WRNO [W]
 WWCR #1 [M-F]
 WYFR (Satellite Network) [A]
 1503
 Radio Pyongyang
 1510
 China Radio Int'l*
 1525
 Radio Veritas [T-F]
 1528
 BBC (af) [M]*
 1530

All India Radio*
 FEBA (Seychelles)
 FEBC (Philippines)
 Radio Austria Int'l
 Radio Finland
 Radio Netherlands Int'l
 Voice of Nigeria [M-H]
 Voice of Russia
 1540
 Radio Veritas [A-M]
 1550
 Voice of Med. (Malta) [F]
 1555
 Radio Japan [A]
 Radio Veritas [A-M]
 Voice of Med. (Malta) [M-H]

1600 UTC
(12:00 PM EDT, 9:00 AM PDT)

BBC (af)
 BBC (am)
 BBC (as pac)
 BBC (eu)
 BBC (south as)
 Canada (North-Quebec) [A]
 Channel Africa
 China Radio Int'l
 Deutsche Welle
 Monitor Radio Int'l [M-A]
 Radio Australia
 Radio France Int'l
 Radio Jordan
 Radio Korea
 Radio Norway Int'l [S]
 Radio Pakistan
 Radio Prague
 Radio Tanzania
 Radio Tirana
 Voice of America (af) [A-S]
 Voice of America (as)
 Voice of America (me)
 Voice of Ethiopia
 Voice of Kenya
 Voice of Russia
 WINB [M-F]
 WRNO [M-F]
 WYFR (Satellite Network) [M-A]
 1604
 HCJB [M-F]
 1610
 China Radio Int'l*
 1612
 Vatican Radio
 1615
 Radio Sweden
 Vatican Radio
 1630
 Channel Africa [F]*
 HCJB [M-F]*
 Radio Canada Int'l
 Radio Dubai
 Voice of America (af) [M-F]*
 Voice of America (as) (Special English)
 Voice of America (me) (Special English)
 Voice of Ethiopia
 Voice of Russia [S-F]
 1638
 Deutsche Welle [M-F]*
 1645
 BBC (am) [S-F]*
 Radio Canada Int'l [M-F]

1700 UTC
(1:00 PM EDT, 10:00 AM PDT)

BBC (af)
 BBC (am)

BBC (as pac)
 BBC (eu)
 BBC (south as)
 Canada (North-Quebec) [A]
 China Radio Int'l
 HCJB
 Monitor Radio Int'l [M-A]
 Polish Radio [A]
 Polish Radio [M-F]*
 Radio Australia
 Radio France Int'l
 Radio Japan
 Radio New Zealand Int'l [M-F]*
 Radio Pakistan
 Radio Prague
 Swiss Radio Int'l
 Voice of America (af)
 Voice of America (as)
 Voice of America (me)
 Voice of Russia
 WINB [M-F]
 WWCR #3 [A]
 1703
 Radio Pyongyang
 1710
 China Radio Int'l*
 Radio Australia*
 1725
 Radio New Zealand Int'l [F]*
 1730
 Radio Austria Int'l
 Radio Netherlands Int'l
 Radio Romania Int'l
 Radio Sweden [M-F]
 Vatican Radio [F]
 Voice of Russia
 1740
 BBC (af) [W-M]*
 1755
 Radio New Zealand Int'l [M-W]*
 1758
 BBC (af) [W]*

1800 UTC
(2:00 PM EDT, 11:00 AM PDT)

All India Radio
 BBC (af) (Newsdesk)
 BBC (as pac) (Newsdesk)
 BBC (eu) (Newsdesk)
 BBC (south as) (Newsdesk)
 Monitor Radio Int'l [M-A]
 Radio Australia
 Radio Cameroon
 Radio Mozambique
 Radio New Zealand Int'l [M-F]*
 Radio Norway Int'l [S]
 Radio Omdurman
 Radio Tanzania
 Radio Vlaanderen Int'l
 Radio Yemen
 Voice of America (af) [A-S]
 Voice of America (af) [M-F]*
 Voice of America (me)
 Voice of Kenya
 Voice of Russia
 WHRI [M-F]
 WINB [M-F]
 WWCR #1 [S-F]
 WWCR #3 [M-A]
 1830
 BBC (af) [A-S]*
 R Slovakia Int'l
 Radio Bangladesh
 Radio Kuwait
 Radio Nacional de Venezuela [M-A]
 Radio Netherlands Int'l
 Radio Tirana

Radio Yemen
 Radio Yugoslavia
 Voice of America (af) [A-S]
 (Special English)
 Voice of America (me) (Special English)
 Voice of Russia
 1840
 Voice of Greece [M-A]
 1855
 Radio New Zealand Int'l [M-H]*
 1858
 BBC (af) [M-F]*

1900 UTC
(3:00 PM EDT, 12:00 PM PDT)

All India Radio
 BBC (af)
 BBC (as pac) (Newshour)
 BBC (eu) (Newshour)
 China Radio Int'l
 Deutsche Welle
 Monitor Radio Int'l [M-A]
 Radio Australia
 Radio Budapest
 Radio Bulgaria
 Radio Japan
 Radio Korea
 Radio New Zealand Int'l
 Radio Portugal Int'l [M-F]
 Radio Romania Int'l [T-S]
 Radio Tallinn [M/H]
 Swiss Radio Int'l (eu)
 Voice of America (af)
 Voice of America (as)
 Voice of America (me)
 Voice of Israel
 Voice of Russia
 WHRI [M-F]
 WINB [M-F]
 WWCR #3 [S-H]
 1901
 Radio Romania Int'l [M]
 1910
 China Radio Int'l*
 Radio Australia [M-F]*
 1925
 Deutsche Welle [M]*
 1930
 Deutsche Welle [T-F]*
 Polish Radio [A-S]
 Polish Radio [M-F]*
 Radio Austria Int'l
 Radio Finland
 Radio Netherlands Int'l
 1935
 RAI Italy

2000 UTC
(4:00 PM EDT, 1:00 PM PDT)

BBC (af) (Newshour)
 BBC (am)
 BBC (as pac) [A]
 BBC (eu)
 BBC (eu) [S-F]*
 China Radio Int'l
 Deutsche Welle
 KVOH [A-S]
 Monitor Radio Int'l [M-A]
 Radio Australia
 Radio Canada Int'l
 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 Greece [M-A]

Voice of Indonesia
 Voice of Nigeria [M-F]
 Voice of Russia
 Voice of Turkey
 WHRI [M-F]
 WINB [M-F]
 WWCR #3 [S]
 2003
 Radio Pyongyang
 2007
 Radio Damascus [M-F]
 2010
 China Radio Int'l*
 Radio New Zealand Int'l [S-H]*
 2025
 RAI Italy
 2030
 Radio Netherlands Int'l
 Radio Riga Int'l [M-F]
 Radio Sweden [M-F]
 Radio Thailand
 Voice of Russia
 2055
 Radio Canada Int'l [M-F]
 Voice of Indonesia [M]
 2057
 Radio Kuwait

2100 UTC
(5:00 PM EDT, 5:00 PM PDT)

All India Radio
 BBC (af)
 BBC (am)
 BBC (as pac)
 BBC (eu)
 Canada (North-Quebec) [A-S]
 China Radio Int'l
 Deutsche Welle
 KVOH [S]
 Monitor Radio Int'l [M-A]
 Radio Australia
 Radio Budapest
 Radio Bulgaria
 Radio Cameroon
 Radio Canada Int'l
 Radio Damascus [F]
 Radio Havana Cuba [M-A]
 Radio Japan
 Radio New Zealand Int'l [A-H]
 Radio Romania Int'l
 Radio Ukraine Int'l
 Radio Vlaanderen Int'l [S-F]
 Radio Yugoslavia
 Spanish National Radio
 Voice of America (af)
 Voice of America (as)
 Voice of America (me)
 Voice of Russia
 2110
 China Radio Int'l*
 Radio Damascus [S-M]
 Radio New Zealand Int'l [M-H]*
 2112
 Radio Damascus [F]
 2115
 BBC (af)*
 BBC (eu)*
 Radio Damascus [T]
 2120
 Radio Cairo
 2130
 Radio Cairo
 Radio Finland
 Radio Havana Cuba [M-A]*
 Radio Nacional de Venezuela [M-A]
 Radio Sweden [M-F]
 Voice of Russia [M-F]

2140
 Voice of Greece [S-F]
 2145
 Radio Damascus [W]
 Radio Korea

2200 UTC
(6:00 PM EDT, 3:00 PM PDT)

All India Radio
 BBC (af) (Newsdesk)
 BBC (am) (Newsdesk)
 BBC (as pac) (Newsdesk)
 BBC (eu) (Newsdesk)
 China Radio Int'l
 Monitor Radio Int'l [M-A]
 Radio Australia
 Radio Canada Int'l
 Radio Havana Cuba [M-A]
 Radio Korea
 Radio New Zealand Int'l [A-H]
 RAI Italy
 Spanish National Radio
 Voice of America (as)
 Voice of Russia
 Voice of Turkey
 WHRI [M-F]
 WWCR #3 [S]
 2203
 Voice of Free China
 2210
 China Radio Int'l*
 2215
 Radio Cairo
 2230
 Radio Canada Int'l [A]
 Radio Finland
 Voice of America (as) (Special English)
 Voice of Russia
 2240
 Radio Cairo
 Voice of Greece [S-F]
 2245
 Organization of American States [M-F]*

2300 UTC
(7:00 PM EDT, 4:00 PM PDT)

[M-F]
 All India Radio
 AWR Latin America [H]*
 BBC (af)
 BBC (am) [S-F]
 BBC (as pac)
 BBC (eu)
 Canada (North-Quebec) [A]
 Deutsche Welle
 Monitor Radio Int'l [M-A]
 Radio Australia
 Radio Bulgaria
 Radio Canada Int'l [A-S]
 Radio Japan
 Radio New Zealand Int'l [A-H]
 Radio Vilnius
 Voice of America (as)
 Voice of Russia
 WHRI [M-F]
 2303
 Radio Pyongyang
 2315
 Radio Cairo
 2330
 Radio Netherlands Int'l
 Radio Vlaanderen Int'l
 Voice of Russia
 2335
 Voice of Greece [S-F]

Scanners/CB/Weather Stations

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Emergency Operations Center

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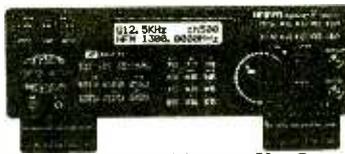
Weather Stations

Now you can be your own weather reporter with the Davis Weather Monitor II. Our top-of-the-line weather station combines the most advanced weather monitoring technologies available into one incredible package. Glance at the display, and see wind direction and wind speed on the compass rose. Check the barometric trend arrow to see if the pressure is rising or falling. Push a button, and read indoor and outdoor temperature, wind chill, humidity and barometric pressure. Our package deal includes the new ultra high resolution 1/100 inch rain collector part #7852-R, and the external temperature/humidity sensor, part #7859-R. The package deal is order #DAVI-R for \$479.95 plus \$15.00 shipping. If you have a personal computer, when you order the optional Weatherlink computer software for \$139.95, you'll have a powerful computerized weather station at an incredible price. For the IBM PC or equivalent order part #7862-R. Apple Mac Plus or higher including PowerBook, order part number 7866-R.

The Weather Monitor II (7440) comes complete with anemometer with 40 feet of cable, external temperature sensor with 25 feet of cable, junction box with 8 feet of cable, AC/power adapter, detailed instruction booklet and one year limited factory warranty.



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Davis Remote Display Unit 7815-R	\$84.95
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Davis Rain Collector II 0.2 mm 7852METRIC-R	\$59.95
Davis Rain Gauge Stand-alone 0.01" 7520-R	\$79.95
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Weatherlink Software for IBM PC/Version 3.0 7862-R	\$139.95
Weatherlink Software for Apple/Version 3.0 7866-R	\$139.95
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6-Conductor 40' (12.2 m) extension cable 7878-R	\$21.95
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8-Conductor 50' (15.2 m) junction box cable 7881-R	\$24.95
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Indoor/Outdoor Thermometer/Barometer & Hygrometer by OSI BA213-R	\$79.95
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Thermometer with AM/FM clock radio by Oregon Scientific CR388-R	\$39.95
Indoor/Outdoor Thermometer with Jumbo Display by OSI JB880EX-R	\$24.95



Bearcat® 9000XLT-R Radio Scanner

Mfg. suggested list price \$769.95/CE Special \$374.95
500 Channels • 20 banks • Alpha numeric display
Turbo Scan • VFO Control • 10 Priority channels
Auto Store • Auto Recording • Reception counter
Frequency step resolution 5, 12.5 & 25 KHz.
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Frequency Coverage:
25,000-549,995 MHz., 760,000-823,995 MHz.,
849,0125-868,995 MHz., 894,0125-1,300,000 MHz.

The Bearcat 9000XLT gives you pure scanning satisfaction with amazing features like TurboSearch™ to search VHF channels at 300 steps per second. This base and mobile scanner is ideal for surveillance professionals because it has a selectable attenuator to help eliminate annoying intermodulation from adjacent frequencies in highly populated areas and selectable AM, Wide FM and Narrow FM modes that allow you to change the default receiving mode of the BC9000XLT. Other features include **Auto Store** - Automatically stores all active frequencies within the specified bank(s). **Auto Recording** - This feature lets you record channel activity from the scanner onto a tape recorder. **Hi-Cut filter** to help eliminate unwanted static noise. You can even get an optional **CTCSS Tone Board** (Continuous Tone Control Squelch System) which allows the squelch to be broken during scanning only when a correct CTCSS tone is received. For maximum scanning enjoyment, order the following optional accessories: **PS001** Cigarette lighter power cord for temporary operation from your vehicle's cigarette lighter \$14.95; **PS002** DC power cord - enables permanent operation from your vehicle's fuse box \$14.95; **MB001** Mobile mounting bracket \$14.95; **BC005** CTCSS Tone Board \$54.95; **EX711** External speaker with mounting bracket & 10 feet of cable with plug attached \$19.95. The BC9000XLT comes with AC adapter, telescopic antenna, owner's manual and one year limited warranty from Uniden.

CB/GMRS Radios



The Maxon GMRS 210+3 transceiver is a PLL synthesized 10 channel radio on General Mobile Radio Service frequencies. It's the ideal radio for storm chasing activities. Two repeater channels are programmable and one channel (462.675 MHz.) is set aside for emergency and safety communications. The seven remaining interstitial frequencies 462.5625, 462.5875, 462.6125, 462.6375, 462.6625,

462.6875 & 462.7125 MHz are all-purpose GMRS radio channels. 2 watts of RF power for exceptional transmitting range. Up to 5 watts when used with the supplied 12 volt vehicular DC power cord. CTCSS built-in. Includes 450mAh Ni-cad rechargeable battery pack, AC/DC wall battery charger, owner's manual, FCC license application, belt clip, antenna. Call 1-800-USA-SCAN to order.

Maxon GMRS210+3-R GMRS transceiver	\$199.95
WTAG6A-R Alkaline battery case - requires 6 AA batteries	\$19.95
WTAG6N2-R 600 mAh rechargeable ni-cad battery for 210+3	\$39.95
WTAG8A-R Carrying case for Maxon GMRS210+3	\$29.95
WTA10G-R Speaker/microphone for Maxon GMRS210+3	\$39.95
WTA13G-R Push-to-talk mini-VOX headset for GMRS210+3	\$79.95
WTA14-R Antenna adaptor/screw-in male to BNC connector	\$14.95
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Cobra 2010GLWX-R SSB base w/weather alert	\$379.95
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Cobra 29LTDWX-R CB/weather alert	\$114.95
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Ranger RC12950-R 25 watt 10 meter	\$239.95
Uniden GMR100-R GMRS Handheld	\$144.95
Uniden WASHINGTON-R SSB CB Base	\$199.95
Uniden GRANTXL-R SSB CB Mobile	\$139.95
Uniden PRO538W-R CB & Weather	\$59.95



VHF Transceiver

RELM® WHS150-R Transceiver/SPECIAL

Mfg. suggested list price \$481.67/CE price \$299.95
Police and fire departments depend on the RELM WHS150 transceiver for direct two-way communications with their police, fire department, civil defense agency or ham radio repeater. The WHS150 is our most popular programmable five watt, 16 channel handheld transceiver that has built-in CTCSS, which may be programmed for any 39 standard EIA tones. Frequency range 148.000 to 174.000 MHz. Will also work 144.000-148.000 MHz with slightly reduced performance. The full function, DTMF compatible keypad also allows for DTMF Encode/Decode and programmable ANI. Weighing only 15.5 oz., it features dealer programmable synthesized frequencies either simplex or half duplex in both 5.0 and 6.25 KHz. increments. Other features include scan level, priority channel, selectable scan delay, selectable 5 watt/1 watt power lists, liquid crystal display, time-out timer and much more. When you order the WHS150 from Communications Electronics Inc., you'll get a complete package deal including antenna, battery, belt clip and user operating instructions. Other accessories are available. A leather carrying case with swivel belt loop part #LCWHS is \$49.95; rapid charge battery charger, part #BCWHS is \$69.95; speaker/microphone, part #SMWHS is \$54.95; extra ni-cad battery pack, part #BP007 is \$59.95. The radio technician maintaining your radio system must order programming instructions part #P1150 for \$18.00 to activate this radio. FCC license required for United States operation.

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PSUN-R Partly Sunny, Weather Junkie's Guide to Weather by Alan Fields	\$11.95
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Grundig Satellite 700-R digital portable shortwave with 512 memory	\$459.95
Grundig Yacht Boy 400-R digital portable shortwave - 40 memory	\$179.95
Grundig Yacht Boy 230-R portable shortwave receiver	\$109.95
Sangean AT800-R portable 20 memory shortwave receiver	\$69.95
Sangean AT803A-R portable shortwave w/AC adapter - 9 memory	\$129.95
Sangean AT808-R portable 45 memory shortwave receiver	\$149.95
Uniden EXP9200-R 900 MHz. 1 or 2 line spread spectrum cordless phone	\$289.95
Uniden EXP9100-R 900 MHz. 1 line cordless spread spectrum telephone	\$229.95
Bogen FR3110-R Digital FAX Friday Fax-on-Demand & answering system	\$399.95
Bogen FR3020-R memory module for Fax Friday/up to 36 minutes	\$99.95
Bogen FR2000-R Digital two-line voice mail & answering machine	\$279.95
Bogen FR0018-R memory module, doubles recording time to 36 minutes	\$79.95
FANS P161-R 60 name/number caller ID, unwanted call blocker, paging	\$149.95
SNI ID200-R Bouncer name/number caller ID, call reject, forward	\$89.95
ICOM GP22-R handheld global positioning system (GPS)	\$494.95
RELM WHS150-R VHF handheld 5 watt, 16 channel transceiver	\$299.95
RELM RH256NB-R VHF 25 watt, 16 channel synthesized transceiver	\$289.95
Ranger RC12950-R 25 watt 10 meter ham radio transceiver	\$239.95
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Uniden LRD9900SW-R Super Wideband Laser/Radar receiver	\$139.95
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ANTMBNC-R magnet mount scanner antenna w/ BNC connector	\$29.95
ANTMMOT-R magnet mount scan antenna w/Motorola plug	\$29.95
ANTMPL-R magnet mount scan antenna with PL259 connector	\$29.95
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FREQUENCIES

0100-0200	Australia, AF Radio	13535as				0100-0200	Palau, KHBN/Voice of Hope	15140as	17630as		
0100-0200	Australia, Radio	9580pa	9660pa	13605pa	13745as	0100-0200 vl	Papua New Guinea, NBC	4890do	9675do		
		1375Eas	15240pa	15245as	15365pa	0100-0130	Philippines, FEBC/R Intl	15450as			
		15415as	5510as	17715as	17750as	0100-0200	Russia, Voice of	9530na	9620na	11750na	12050na
		17795pa	17860pa	17880as				13645na	13665na	15180na	15425na
0100-0200 vl	Australia, VL8A Alice Spg	4835do				0100-0200	Slovakia, AWR	15580as			
0100-0200 vl	Australia, VL8K Katherine	5025co				0100-0127	Slovakia, R Slovakia Intl	9465as			
0100-0200 vl	Australia, VL8T Tent Crk	4910co				0100-0200	South Korea, R Korea Intl	5930na	7300na	9440sa	
0100-0200	Canada, CBC N Quebec Svc	9625co				0100-0200	Spain, R Exterior Espana	7550eu	11810na	15575sa	
0100-0200	Canada, CFCX Montreal	6005do				0100-0200	Sri Lanka, SLBC Colombo	9540na			
0100-0200	Canada, CFRX Toronto	6070co				0100-0200	Switzerland, Swiss R Intl	15425as			
0100-0200	Canada, CFPV Calgary	6030co				0100-0130	United Kingdom, BBC London	5885na	6135na	9885na	9905na
0100-0200	Canada, CHNX Halifax	6130co						5965as	5970sa	5975na	6175na
0100-0200	Canada, CKZN St John's	6160co						7325na	9590na	9760as	9915sa
0100-0200	Canada, CKZU Vancouver	6160do						11750na	11955as	15360as	17790as
0100-0200	Canada, RCI Montreal	6120am	9535am	9755am	11940am	0100-0200	USA, KAIJ Dallas TX	13740am	13815am		
		13670am				0100-0200	USA, KTNB Salt Lk City UT	7510am			
0100-0130	Costa Rica, AWR Alajuela	5030ca	6150sa	7375am	13750am	0100-0200	USA, KVQH Los Angeles CA	9975am			
0100-0200	Costa Rica, R Peace Intl	7385am	9400am	15050am		0100-0200	USA, KWHR Naalehu HI	17510au			
0100-0110	Croatia, Croatian Radio	5895eu	7370eu	13830eu		0100-0200	USA, Monitor Radio Intl	7535na	9430am		
0100-0200	Cuba, Radio Havana Cuba	6000na	9830na			0100-0200	USA, VOA Washington DC	5995am	6130am	7405am	9455am
0100-0127	Czech Rep, Radio Prague	7345na	9405na					9775am	13740am	15170as	15205am
0100-0200	Ecuador, HCBJ Quito	9745am	15540am	21455am				15250as	17740as	21550as	
0100-0150	Germany, Deutsche Welle	6040na	6085na	6145na	9555na	0100-0200	USA, WEWN Birmingham AL	5825eu	7425na	15375eu	
		9640na	11740na	11865na		0100-0200	USA, WHRI Noblesville IN	5745am			
0100-0200	Guatemala, Radio Cultural	3300do				0100-0200	USA, WINB Red Lion PA	11950na			
0100-0130	Hungary, Radio Budapest	6000na	9835na	11910na		0100-0200	USA, WJCR Upton KY	7490na	13595na		
0100-0130	Iran, VOIRI Tehran	7260ra	9022na	9670na		0100-0200	USA, WRNO New Orleans LA	7355am			
0100-0115	Italy, RAI Rome	9645ra	11800na			0100-0200	USA, WVHA Green Bush ME	9852eu			
0100-0200	Japan, NHK/Radio	5960na	9680as	11840as	11860as	0100-0200	USA, WWCR Nashville TN	5065am	5935am	7435am	
		11900as	11910as	17810as	17845as	0100-0200	USA, WYFR Okeechobee FL	6065na	9505na		
0100-0200 smtwh	Malaysia, Radio	7295do				0130-0200	Austria, R Austria Intl	9655na			
0100-0130	Moldova, R Moldova Intl	7190na				0130-0150	Greece, Voice of	6260na	9935na	11645na	
0100-0200	Netherlands, Radio	5905as	7305as			0130-0200	Netherlands, Radio	9860as			
0100-0125	Netherlands, Radio	6020na	6165na	9840na		0130-0200 tw/ha	Portugal, Radio	6075na	9570na		
0100-0200	New Zealand, R NZ Intl	15115pa				0130-0200	Sweden, Radio	9695au			
0100-0130 m	Norway, Radio Norway Intl	7480ra	9560na			0140-0200	Vatican State, Vatican R	5980as	7335as		

SELECTED PROGRAMS

Sundays

- 0110 Radio Japan: Asia Weekly. A magazine of news from other Asian broadcasters, entertainment update and music.
- 0110 Voice of America (am/ca): On the Line. A discussion of U.S. policies and contemporary issues.
- 0110 Voice of America (as): VOA Sunday. See S 0010.
- 0111 Radio Japan: Asian News Summary. This ten-minute wrap-up of regional events is heard as a segment of the program Asia Weekly.
- 0121 Radio Japan: Business Report. A summary of regional financial news heard as part of the program Asia Weekly.
- 0125 Radio Japan: Entertaining in Asia. NEW! A segment of "Asian Report" which focuses on an aspect of entertainment in the region.
- 0130 BBC (am): People and Politics. Background to the British political scene.
- 0130 BBC (as pac): From Our Own Correspondent. BBC correspondents comment on the background to the news. 0130 Voice of America (am/ca): Press Conference USA. Newsmakers are questioned by Washington journalists in the VOA studios.
- 0145 BBC (as pac): Write On. Air your views about World Service write to PO Box 76, Bush House, Strand, London WC2B 4PH.
- 0146 Radio Japan: Asia Kaleidoscope. NEW! A segment of the program "Asian Report" devoted to life in Japan and the region.
- 0155 Radio Japan: Tokyo Pop-In. A sample of the Japanese music scene.

Mondays

- 0110 Radio Japan: Let's Learn Japanese. See S 0310.
- 0110 Voice of America (am/ca): New Horizons. See S 1110.
- 0110 Voice of America (as): VOA Today. See S 2310.
- 0125 Radio Japan: Media Roundup. See S 0525.
- 0130 BBC (am): Composer of the Month. In depth looks at classical composers and their music. A different composer is featured each month.
- 0130 BBC (as pac): Anything Goes. See S 0530.
- 0130 Voice of America (am/ca): Issues in the News. See S 1130.
- 0145 BBC (south as): Global Concerns. Update on environmental issues.
- 0150 Radio Japan: Viewpoint. See S 0550.
- 0155 Radio Japan: Tokyo Pop-In. See S 0155.

Tuesdays

- 0110 Voice of America (am/ca): Report to the Americas. The latest news affecting the region, as well as a roundup of sports, financial news, and the weather forecast.
- 0110 Voice of America (as): VOA Today. See S 2310.
- 0115 Radio Japan: Today's Top News Asia. See M 1515.
- 0125 Radio Japan: Profile. See M 1525.
- 0130 BBC (am): Omnibus. See M 1130.
- 0130 BBC (as pac): Health Matters. See M 0445.
- 0155 Radio Japan: Tokyo Pop-In. See S 0155.
- 0155 Voice of America (am/ca): VOA Editorial. See S 1455.

Wednesdays

- 0110 Voice of America (am/ca): Report to the Americas. See T 0110.
- 0110 Voice of America (as): VOA Today. See S 2310.
- 0115 BBC (as pac): On Screen. See S 1215.
- 0115 Radio Japan: Today's Top News Asia. See M 1515.
- 0125 Radio Japan: Enjoy Japanese. See T 1525.
- 0130 BBC (am): Andy Kershaw's World of Music. See S 1230.
- 0155 Radio Japan: Tokyo Pop-In. See S 0155.
- 0155 Voice of America (am/ca): VOA Editorial. See S 1455.

Thursdays

- 0110 Voice of America (am/ca): Report to the Americas. See T 0110.
- 0110 Voice of America (as): VOA Today. See S 2310.
- 0115 BBC (as pac): New Ideas. See S 1530.
- 0115 Radio Japan: Today's Top News Asia. See M 1515.
- 0125 Radio Japan: History and Classics. See W 1525.
- 0130 BBC (am): Assignment. A weekly examination of a topical issue.
- 0135 BBC (af/as pac/eu): Arts Feature. Writers in a Nutshell (6th, 13th). See S 0005.
- 0145 BBC (as pac): The Farming World. See M 0015.
- 0155 Radio Japan: Tokyo Pop-In. See S 0155.
- 0155 Voice of America (am/ca): VOA Editorial. See S 1455.

Fridays

- 0110 Voice of America (am/ca): Report to the Americas. See T 0110.
- 0110 Voice of America (as): VOA Today. See S 2310.
- 0115 Radio Japan: Current Views. A Radio Japan editorial.
- 0120 Radio Japan: Enjoy Japanese. See T 1525.

- 0145 BBC (as pac): Global Concerns. See M 0145.
- 0155 Radio Japan: Tokyo Pop-In. See S 0155.
- 0155 Voice of America (am/ca): VOA Editorial. See S 1455.

Saturdays

- 0110 Voice of America (am/ca): On the Line. See S 0110.
- 0110 Voice of America (as): VOA Saturday. See S 0010.
- 0115 BBC (as pac): Seven Days. See A 0030.
- 0115 Radio Japan: Today's Top News Asia. See M 1515.
- 0125 Radio Japan: Music and Book Beat. See F 1525.
- 0130 BBC (am): Network UK. See H 1430.
- 0130 BBC (as pac): Jazz Now and Then. George Reid presents a mixture of jazz for all ages.
- 0130 Voice of America (am/ca): Press Conference USA. See S 0130.
- 0145 BBC (as pac): Good Books. See M 0030.
- 0155 Radio Japan: Tokyo Pop-In. See S 0155.

HAUSER'S HIGHLIGHTS GREECE: VOICE OF GREECE

J-95 to us:
1200-1350 15630, 17525
0000-0350 6260, 9935,
11645 via Kavala to western N.
America
(John Babbis, MD)

FREQUENCIES

0300-0400	Australia, Radio	9580pa 15365pa 17860pa	9660pa 15510as	15240pa 17750pa	15245as 17795pa	0300-0400	Taiwan, VO Free China	5950na 15345as 11890na	9680na	11745as	11825as
0300-0400 vl	Australia, VL8A Alice Spg	4835do				0300-0330	Thailand, Radio	11890na			
0300-0400 vl	Australia, VL8K Katherine	5025do				0300-0400	Turkey, Voice of	9445na			
0300-0400 vl	Australia, VL8T Tent Crk	4910do				0300-0400	Ukraine, R Ukraine Intl	4870na 11790na	6055na	7180na	9810na
0300-0400	Bahrain, Radio	6010do				0300-0330	United Kingdom, BBC London	5970sa 9760as	6135af	7235me	7325na
0300-0400	Botswana, Radio	4830af	7255af			0300-0400	United Kingdom, BBC London	3255af 6190af 11760as	5975na 6195eu	6005af	6175na 9600af
0300-0400 vl	Canada, CBC N Quebec Svc	9625do				0300-0400	USA, KAIJ Dallas TX	5810am			
0300-0400	Canada, CFCX Montreal	6005do				0300-0400	USA, KTVN Salt Lk City UT	7510am			
0300-0400	Canada, CFRX Toronto	6070do				0300-0400	USA, KVOH Los Angeles CA	9975am			
0300-0400	Canada, CFVP Calgary	6030do				0300-0400	USA, KWHR Naalehu HI	17510au			
0300-0400	Canada, CHNX Halifax	6130do				0300-0400	USA, Monitor Radio Intl	5850na	9455af		
0300-0400	Canada, CKZN St John's	6160do				0300-0400	USA, VOA Washington DC	6035af 7405af	7105af 9575af	7280af 9885af	7340af
0300-0400	Canada, CKZU Vancouver	6160do				0300-0400	USA, WEWN Birmingham AL	7425na			
0300-0400	China, China Radio Intl	9690na	9710na	11715na		0300-0400	USA, WHRI Noblesville IN	5745am			
0300-0400	Costa Rica, R Peace Intl	7385am	9400am			0300-0400	USA, WINB Red Lion PA	11950eu			
0300-0400 vl	Costa Rica, Faro del Carib	5055do				0300-0400	USA, WJCR Upton KY	7490na	13595na		
0300-0310	Croatia, Croatian Radio	5895eu	7370eu	13830eu		0300-0400	USA, WRNO New Orleans LA	7395am			
0300-0400	Cuba, Radio Havana Cuba	6000na	9820na	9830na		0300-0400 tha	USA, WVHA Green Bush ME	7465eu			
0300-0327	Czech Rep, Radio Prague	5930na	7345na			0300-0400	USA, WWCR Nashville TN	5065am	5935am	7435am	
0300-0400	Ecuador, HCJB Quitto	9745am	15540am	21455am		0300-0400	USA, WYFR Okeechobee FL	6065na	9505na		
0300-0330	Egypt, Radio Cairo	9475na				0300-0315	Vatican State, Vatican R	6095na	7305na		
0300-0330	Germany, Deutsche Welle	6085na 9640na	6185na 11750na	9535na 17810as	9615na	0300-0400	Zimbabwe, ZBC/Radio 3	3306do	3396do	4828do	
0300-0400	Guatemala, Radio Cultural	3300do				0315-0330 s	Greece, Voice of	6260na	9935na	11645na	
0300-0400	Japan, NHK/Radio	9680na	11840as	17810as		0320-0350	Vatican State, Vatican R	5865af	7360af	9725af	
0300-0330	Japan, NHK/Radio	11885na	11895ca	15230na		0330-0357	Czech Rep, Radio Prague	9480as			
0300-0400	Kenya, Kenya Broadc Corp	4885do	4935do			0330-0400 fas	Mongolia, R Ulan Bator	7290na	12000na		
0300-0400 s	Lebanon, Wings of Hope	9960me				0330-0400	Sweden, Radio	7120na	9850na		
0300-0400 smtwh	Malaysia, Radio	7295do				0330-0400	Tanzania, Radio	5050af			
0300-0330 tw	Mongolia, R Ulan Bator	9960na	12000na			0330-0400	UAE, Radio Dubai	11945na	13675na		
0300-0325	Netherlands, Radio	9860as	11655as			0330-0400	United Kingdom, BBC London	9610af 17790as	11730af	15280as	15575af
0300-0400	New Zealand, R NZ Intl	15115pa				0340-0350	Greece, Voice of	6260na	9935na	11645na	
0300-0400	Palau, KHBN/Voice of Hope	15140as	17630as			0345-0400	Tajikistan, Radio	7245as			
0300-0400 vl	Papua New Guinea, NBC	4890do	9675do								
0300-0330	Philippines, R Pilipinas	13760as	17760as	21580as							
0300-0400	Russia, Voice of	9620na 13665na	12050na 15180na	13645na 15425na	15580na						
0300-0400	S Africa, Channel Africa	3220af	5955af								

SELECTED PROGRAMS

Sundays

- 0310 Radio Japan: Hello from Tokyo. The weekend magazine program.
- 0310 Radio Japan: Let's Learn Japanese. A course in the Japanese language.
- 0310 Voice of America (af): VOA Sunday. See S 0010.
- 0330 BBC (am): From Our Own Correspondent. See S 0130.
- 0330 BBC (as pac): The John Dunn Show. A melodic mix of songs old and new.
- 0330 BBC (eu): From Our Own Correspondent. See S 0130.
- 0335 BBC (af): Postmark Africa. Expert answers to any question under the sun.
- 0350 BBC (am): Arts Feature. Writers in a Nutshell (2nd, 9th). See S 0005.
- 0350 BBC (eu): Waveguide. Hear World Service better.

Mondays

- 0300 Voice of America (af): Daybreak Africa. Magazine program of African news, sports, features, and correspondent reports.
- 0315 Radio Japan: Radio Japan Magazine Hour. The weekday magazine program.
- 0316 Radio Japan: Sports Spotlight. Focus on a current sporting event in the region.
- 0325 Radio Japan: Japan Diary. Life in Japan as seen through the eyes of a foreign resident in Japan.
- 0330 BBC (am): Quiz. Brain of Britain. See A 1230.
- 0330 BBC (as pac): Off the Shelf. Daily readings from the best of world literature.
- 0330 BBC (eu): Europe Today. All the latest news, analysis and comment.
- 0330 Radio Japan: Close Up. Featuring a Japanese person of note.
- 0333 BBC (af): Network Africa. Breakfast show of news, sport, personalities, music, and listener's comments.
- 0340 Voice of America (af): Development Report (Special English). See M 0040.
- 0345 Voice of America (af): This is America (Special English). See M 0045.
- 0347 Radio Japan: News Commentary. An editorial opinion on the current news.

Tuesdays

- 0300 Voice of America (af): Daybreak Africa. See M 0300.
- 0315 Radio Japan: Radio Japan Magazine Hour. See M 0315.
- 0320 Radio Japan: Close Up. See M 0330.
- 0330 BBC (am): The World Today. See M 1645.
- 0330 BBC (as pac): Off the Shelf. See M 0330.
- 0330 BBC (eu): Europe Today. See M 0330.
- 0330 Radio Japan: Japanese Culture Today. Comparing modern-day Japan with the customs of old.
- 0333 BBC (af): Network Africa. See M 0333.
- 0340 Voice of America (af): Agriculture Report (Special English). See T 0040.
- 0345 BBC (am): Development '95. See M 1230.
- 0345 Radio Japan: Japan Diary. See M 0325.
- 0345 Voice of America (af): Science in the News (Special English). See T 0045.
- 0350 Radio Japan: News Commentary. See M 0347.

Wednesdays

- 0300 Voice of America (af): Daybreak Africa. See M 0300.
- 0315 Radio Japan: Radio Japan Magazine Hour. See M 0315.
- 0320 Radio Japan: Asian Report. NEW! Current events in the Asia-Pacific region.
- 0330 BBC (am): The World Today. See M 1645.
- 0330 BBC (as pac): Off the Shelf. See M 0330.
- 0330 BBC (eu): Europe Today. See M 0330.
- 0330 Radio Japan: Close Up. See M 0330.
- 0333 BBC (af): Network Africa. See M 0333.
- 0340 Voice of America (af): Science Report (Special English). See W 0040.
- 0341 Radio Japan: Japan Diary. See M 0325.
- 0345 BBC (am): Human Interest Feature. Images of Britain (5th, 12th, 19th). See T 0530.
- 0345 Voice of America (af): Space and Man (Special English). See W 0045.
- 0347 Radio Japan: News Commentary. See M 0347.

Thursdays

- 0300 Voice of America (af): Daybreak Africa. See M 0300.
- 0315 Radio Japan: Radio Japan Magazine Hour. See M 0315.

- 0330 BBC (am): The World Today. See M 1645.
- 0330 BBC (as pac): Off the Shelf. See M 0330.
- 0330 BBC (eu): Europe Today. See M 0330.
- 0330 Radio Japan: Crosscurrents. Radio Japan's mailbag program.
- 0333 BBC (af): Network Africa. See M 0333.
- 0340 Voice of America (af): Science Report (Special English). See W 0040.
- 0342 Radio Japan: Japan Diary. See M 0325.
- 0345 Voice of America (af): The Making of a Nation (Special English). See H 0045.
- 0348 Radio Japan: News Commentary. See M 0347.

Fridays

- 0300 Voice of America (af): Daybreak Africa. See M 0300.
- 0315 Radio Japan: Radio Japan Magazine Hour. See M 0315.
- 0330 BBC (am): The World Today. See M 1645.
- 0330 BBC (as pac): Off the Shelf. See M 0330.
- 0330 BBC (eu): Europe Today. See M 0330.
- 0330 Radio Japan: Close Up. See M 0330.
- 0333 BBC (af): Network Africa. See M 0333.
- 0340 Voice of America (af): Environment Report (Special English). A five-minute report on a specific environmental subject.
- 0342 Radio Japan: Japan Diary. See M 0325.
- 0345 Voice of America (af): American Mosaic (Special English). Reports about music, books, movies, and student life in the USA.
- 0348 Radio Japan: News Commentary. See M 0347.

Saturdays

- 0310 Radio Japan: This Week. A weekly variety show.
- 0310 Voice of America (af): VOA Saturday. See S 0010.
- 0330 BBC (am): The World Today. See M 1645.
- 0330 BBC (as pac): The Vintage Chart Show. See W 1215.
- 0330 BBC (eu): Europe Today. See M 0330.
- 0331 BBC (af): African Quiz (biweekly). Test your knowledge of Africa.
- 0331 BBC (af): This Week and Africa (biweekly). A roundup of the week's political developments across the continent.
- 0345 BBC (am): Global Concerns. See M 0145.

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	\$34.95
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	\$99.95

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 50-100kHz 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	\$27.95
CSCA Matching case set	\$14.95
FR-1 FM receiver kit	\$24.95
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

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



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

FULLY WIRED & TESTED

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	\$28.95
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.

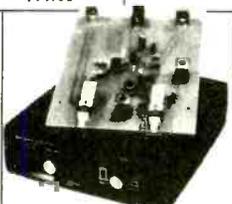
AR-1 Aircraft Receiver Kit	\$29.95
C-AR Case and Knobset for AR-1	\$14.95

FOXHOUND DIRECTION FINDER

Locate hidden or unknown transmitters fast. The Fox-

hound direction finder connects to the antenna 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 built-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 Foxhound 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

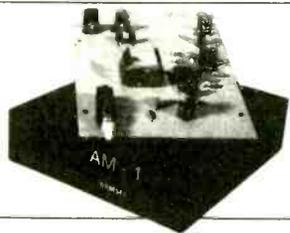
shortwave bands. An additional switch allows the selection of any two bands of interest, each 1 MHz wide. Set one range for daytime frequencies and one for nighttime when propagation is different, choose any two frequencies between 3 and 22 MHz. Frequencies are tuned on your AM radio, making it easy 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.

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GSC Matching Case and Knob Set	\$14.95

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SR-1 Shortwave Radio Kit	\$34.95
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FREQUENCIES

0500-0530	Australia, AF Radio	13535as				0500-0600	Swaziland, Swazi Radio	6155af			
0500-0600	Australia, Radio	9580pa	9660pa	13605as	15240pa	0500-0600	Swaziland, Trans World R	3200af	5055af	6070af	9500af
		15245as	15365pa	15415as	17715pa	0500-0515	Switzerland, Swiss R Intl	6165eu	9535eu		
		17795pa	17860pa			0500-0502	Uganda, Radio	4976do			
0500-0600 vl	Australia, VL8A Alice Spg	4835do				0500-0600	United Kingdom, BBC London	3255af	3955eu	5975na	6005af
0500-0600 vl	Australia, VL8K Katherine	5025do						6180eu	6190af	6195eu	7160as
0500-0600 vl	Australia, VL8T Tent Crk	4910do						9410af	9600af	9640na	11760as
0500-0600	Bahrain, Radio	6010do						11955as	12095me	15280as	15310as
0500-0600	Canada, CFCX Montreal	6005do						15360as	15420af	15575me	17885af
0500-0600	Canada, CFRX Toronto	6070do				0500-0600	USA, KAIJ Dallas TX	5810am			
0500-0600	Canada, CFVP Calgary	6030do				0500-0600	USA, KTBN Salt Lk City UT	7510am			
0500-0600	Canada, CHNX Halifax	6130do				0500-0600	USA, KVOH Los Angeles CA	9975am			
0500-0600	Canada, CKZU Vancouver	6160do				0500-0600	USA, KWHR Naalehu HI	17780as			
0500-0530 mtwhf	Canada, RCI Montreal	6050eu	7295eu	15430af	17840af	0500-0600	USA, Monitor Radio Intl	7535eu			
0500-0600	Costa Rica, R Peace Intl	7385am	9400am			0500-0600	USA, VOA Washington DC	5995eu	6035af	6040eu	6140af
0500-0510	Croatia, Croatian Radio	5895eu	7370eu	13830eu				6873af	7170me	7285af	7405af
0500-0600	Cuba, Radio Havana Cuba	9820na	9830na					9575af	9630af	11965af	12080af
0500-0600	Ecuador, HCJB Quito	9745am						15205me	15600af		
0500-0600 as	Eq Guinea, R East Africa	9585af				0500-0600	USA, WEWN Birmingham AL	7425na			
0500-0550	Germany, Deutsche Welle	5960na	6175na	6185na	9515na	0500-0600	USA, WHRI Noblesville IN	7315am	9495am		
		11705na				0500-0600	USA, WINB Red Lion PA	11950na			
0500-0600 mtwh/vl	Italy, IRRS Milan	7125va				0500-0600	USA, WJCR Upton KY	7490na	13595na		
0500-0600	Japan, NHK/Radio	5975eu	6110na	7230eu	9680na	0500-0600 mtwhfa	USA, WMLK Bethel PA	9465eu			
		11740as	11885na	11955as	17810as	0500-0600	USA, WRNO New Orleans LA	7395am			
0500-0600	Kenya, Kenya Broadc Corp	4885do				0500-0600	USA, WWCR Nashville TN	5065am	5935am	7435am	
0500-0600 s	Lebanon, Wings of Hope	9960me				0500-0600	USA, WYFR Okeechobee FL	5985na	9985eu	11580eu	
0500-0525	Netherlands, Radio	6165na	9590na			0500-0530	Vatican State, Vatican R	5865af	7360af	9725af	11625af
0500-0600	New Zealand, R NZ Intl	9570pa				0500-0520	Vatican State, Vatican R	4010eu			
0500-0505	Nigeria, FRCN/Radio	3326do	4990do			0500-0600	Vietnam, Voice of	7360na			
0500-0600	Nigeria, FRCN/Voice of	7255af				0500-0600	Zimbabwe, ZBC/Radio 3	3306do	3396do		
0500-0600	Palau, KHBN/Voice of Hope	15140as	17630as			0525-0600	Ghana, Ghana Broadc Corp	3366do	4915do		
0500-0600 vl	Papua New Guinea, NBC	4890do	9675do			0530-0600	Australia, Radio	15510as	15565as	17880as	
0500-0600	Russia, AWR	9895me				0530-0600	Austria, R Austria Intl	6015na			
0500-0600	Russia, Voice of	12010na	12030na	12050na	13370as	0530-0600	Romania, R Romania Intl	11810af	15250af	15340af	17745af
		13665na	15425na	15580na				17790af			
0500-0600	S Africa, Channel Africa	5955af	9695af			0530-0600	United Kingdom, BBC London	11735eu			
0500-0545 f	Seychelles, FEBA Radio	15555me									
0500-0600	Spain, R Exterior Espana	9540na									

SELECTED PROGRAMS

Sundays

- 0510 Radio Japan: Let's Learn Japanese. See S 0310.
- 0510 Voice of America (af/eu): VOA Sunday. See S 0010.
- 0525 Radio Japan: Media Roundup. Reception reports, DX/media news, and equipment reviews.
- 0530 BBC (am): John Peel. Tracks from newly released albums and singles from the contemporary music scene.
- 0530 BBC (as pac): Anything Goes. A variety of music and much more with Bob Holness.
- 0535 BBC (af): Postmark Africa. See S 0335.
- 0550 Radio Japan: Viewpoint. Opinions of a guest personality.
- 0555 Radio Japan: Tokyo Pop-In. See S 0155.

Mondays

- 0510 Voice of America (af/eu): VOA Today. See S 2310.
- 0515 Radio Japan: Radio Japan Magazine Hour. See M 0315.
- 0516 Radio Japan: Sports Spotlight. See M 0316.
- 0525 Radio Japan: Japan Diary. See M 0325.
- 0530 BBC (eu): Anything Goes. See S 0530.
- 0530 Radio Japan: Close Up. See M 0330.
- 0533 BBC (af): Network Africa. See M 0333.
- 0547 Radio Japan: News Commentary. See M 0347.
- 0555 Radio Japan: Tokyo Pop-In. See S 0155.

Tuesdays

- 0510 Voice of America (af/eu): VOA Today. See S 2310.
- 0515 Radio Japan: Radio Japan Magazine Hour. See M 0315.
- 0520 Radio Japan: Close Up. See M 0330.
- 0530 BBC (af/eu): Human Interest Feature. Images of Britain (4th, 11th, 18th). Insights into British attitudes and character expressed by journalists from around the world.
- 0530 BBC (am): Multitrack: Hit List. See M 1615.
- 0530 BBC (as pac): Discovery. See T 0230.
- 0530 Radio Japan: Japanese Culture Today. See T 0330.
- 0533 BBC (af): Network Africa. See M 0333.
- 0545 BBC (eu): On the Move. See S 0615.
- 0545 Radio Japan: Japan Diary. See M 0325.
- 0555 Radio Japan: Tokyo Pop-In. See S 0155.

Wednesdays

- 0510 Voice of America (af/eu): VOA Today. See S 2310.
- 0515 Radio Japan: Radio Japan Magazine Hour. See M 0315.
- 0520 Radio Japan: Asian Report. See W 0320.

- 0530 BBC (am): Megamix. See T 1615.
- 0530 BBC (as pac): Omnibus. See M 1130.
- 0530 BBC (eu): Omnibus. See M 1130.
- 0530 Radio Japan: Close Up. See M 0330.
- 0533 BBC (af): Network Africa. See M 0333.
- 0541 Radio Japan: Japan Diary. See M 0325.
- 0547 Radio Japan: News Commentary. See M 0347.
- 0555 Radio Japan: Tokyo Pop-In. See S 0155.

Thursdays

- 0510 Voice of America (af/eu): VOA Today. See S 2310.
- 0515 Radio Japan: Radio Japan Magazine Hour. See M 0315.
- 0530 BBC (am): Multitrack: X-Press. See W 1615.
- 0530 BBC (as pac): Assignment. See H 0130.
- 0530 Radio Japan: Crosscurrents. See H 0330.
- 0533 BBC (af): Network Africa. See M 0333.
- 0542 Radio Japan: Japan Diary. See M 0325.
- 0545 BBC (af/eu): Classical Music Feature. Opera Behind the Scenes (6th, 13th). See T 0615.
- 0548 Radio Japan: News Commentary. See M 0347.
- 0555 Radio Japan: Tokyo Pop-In. See S 0155.

Fridays

- 0510 Voice of America (af/eu): VOA Today. See S 2310.
- 0515 Radio Japan: Radio Japan Magazine Hour. See M 0315.
- 0530 BBC (am): Andy Kershaw's World of Music. See S 1230.
- 0530 BBC (eu): Andy Kershaw's World of Music. See S 1230.
- 0530 Radio Japan: Close Up. See M 0330.
- 0533 BBC (af): Network Africa. See M 0333.
- 0542 Radio Japan: Japan Diary. See M 0325.
- 0548 Radio Japan: News Commentary. See M 0347.
- 0555 Radio Japan: Tokyo Pop-In. See S 0155.

Saturdays

- 0510 BBC (south as): Quiz. Brain of Britain. See A 1230.
- 0510 Radio Japan: This Week. See A 0310.
- 0510 Voice of America (af/eu): VOA Saturday. See S 0010.
- 0530 BBC (am): Multitrack: Alternative. See F 1430.
- 0530 BBC (as pac): Composer of the Month. See M 0130.
- 0530 BBC (eu): The John Dunn Show. See S 0330.
- 0531 BBC (af): African Quiz (biweekly). See A 0331.
- 0531 BBC (af): This Week and Africa (biweekly). See A 0331.

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tion)
Actually on 6000 clashing with Cuba
(George Thurman, TX, Brian
Alexander, PA)

FREQUENCIES

0600-0700	Australia, Radio	11910pa	13605as	13755pa	15240pa	0600-0700	South Korea, R Korea Intl	7205na	11945na
		15365pa	15510as	17715as	17795pa	0600-0700	Swaziland, Swazi Radio	6155af	
0600-0630	Australia, Radio	9580pa	9660pa	15415pa		0600-0700	Switzerland, Trans World R	5055af	6070af 9500af 9650af
0600-0700 vl	Australia, VLBA Alice Spg	4835do				0600-0630	Switzerland, Swiss R Intl	6165eu	9535af 9885af 13635af
0600-0700 vl	Australia, VL8K Katherine	5025do						15340af	
0600-0700 vl	Australia, VL8T Tent Crk	4910do				0600-0615 s	Uganda, Radio	4976do	7110do
0600-0700	Bahrain, Radio	6010do				0600-0700	United Kingdom, BBC London	3955eu	6005af 6190af 6195eu
0600-0700	Canada, CFCX Montreal	6005do						7160af	9600af 9640na
0600-0700	Canada, CFRX Toronto	6070do						11760as	11780eu 11940af 11955as
0600-0700	Canada, CFPV Calgary	6030do						12095me	15070af 15280as 15310as
0600-0700	Canada, CHNX Halifax	6130do						15360me	15400af 15420af 15575af
0600-0700	Canada, CKZU Vancouver	6160do						17790as	
0600-0700	Costa Rica, R Peace Intl	7385am	9400am			0600-0630	United Kingdom, BBC London	6180eu	
0600-0610 mtwhfa	Croatia, Croatian Radio	5895eu	7370eu	13830eu		0600-0700	USA, KAIJ Dallas TX	5810am	9815am
0600-0700	Cuba, Radio Havana Cuba	9820na				0600-0700	USA, KTVN Salt Lk City UT	7510am	
0600-0630	Czech Rep, Radio Prague	7345eu	15640eu			0600-0700	USA, KVOH Los Angeles CA	9975am	
0600-0700	Ecuador, HCJB Quito	9745am				0600-0700	USA, KWHR Naalehu HI	17780as	
0600-0700 as	Eq Guinea, R East Africa	9565af				0600-0700	USA, Monitor Radio Intl	7535eu	
0600-0650	Germany, Deutsche Welle	11915af	11960af	13790af	15185af	0600-0700	USA, VOA Washington DC	3985eu	5995eu 6035af 6040eu
		15205af	17820af	17875af	21680af			6060eu	6140af 6873eu 7170me
		3316do	4915do					7325me	7405af 9530af 11805af
0600-0615	Ghana, Ghana Broadc Corp	7125va				0600-0630	USA, VOA Washington DC	11965eu	12080af 15205me 15600af
0600-0700 mtwh/vl	Italy, IRRS Milan	11955as	17810as					6035af	7405af 9630af 9665af
0600-0700	Japan, NHK/Radio	4885do	4935do					11950af	12035af 12080af
0600-0700	Kenya, Kenya Broadc Corp	9825do				0600-0700	USA, WEWN Birmingham AL	7425na	
0600-0700 vl	Kiribati, Radio	9960me				0600-0700	USA, WHRI Noblesville IN	7315am	9495am
0600-0700 s	Lebanon, Wings of Hope	7275do				0600-0700	USA, WINB Red Lion PA	11950na	
0600-0700 vl	Liberia, Radio ELBC	4760do				0600-0700	USA, WJCR Upton KY	7490na	13595na
0600-0700	Liberia, Radio ELWA	7295do				0600-0700	USA, WMLK Bethel PA	9465eu	
0600-0700 asmtwh	Malaysia, Radio	6175as	9750as	15295as		0600-0700 a	USA, WVHA Green Bush ME	7455eu	
0600-0700	Malaysia, Voice of	9765me				0600-0700	USA, WWCR Nashville TN	5065am	5935am 7435am
0600-0700 mtwhfa	Malta, V of Mediterranean	9765me				0600-0700	USA, WYFR Okeechobee FL	5985na	7355eu 9985eu
0600-0635 s	Malta, V of Mediterranean	9570pa				0600-0700	Zimbabwe, ZBC/Radio 3	5975do	6045do
0600-0700	New Zealand, R NZ Intl	3326do	4990do			0630-0700	Australia, Radio	5995as	6020pa 6080pa 9860pa
0600-0630	Nigeria, FRCN/Radio	7255af						15245as	
0600-0700	Nigeria, FRCN/Voice of	15175pa				0630-0700	Austria, R Austria Intl	6015na	
0600-0630 m	Norway, Radio Norway Intl	15140as	17630as			0630-0655	Belgium, R Vlaanderen Int	6015eu	9925au
0600-0700	Palau, KHBN/Voice of Hope	4890do	9675do			0631-0640	Romania, R Romania Intl	7225eu	9550eu 9665eu 11810eu
0600-0700 vl	Papua New Guinea, NBC	12010na	12030na	12050na	13370as	0640-0700	Monaco, Trans World Radio	7115eu	
0600-0700	Russia, Voice of	13665na	15425na	15560as	15580as	0640-0700	Vatican State, Vatican R	5865af	7360af 9660af 11625af
		17570as				0645-0700	Finland, YLE/Radio	6120eu	9560eu 11755af
0600-0700	Slovakia, AWR	7215eu	13715af			0645-0700	Romania, R Romania Intl	15205pa	17720pa 17805pa
0600-0630 vl	Solomon Islands, SIBC	5020do	9545do			0645-0700 s	Romania, R Romania Intl	11775pa	15335pa

SELECTED PROGRAMS

Sundays

- 0610 Radio Japan: Hello from Tokyo. See S 0310.
- 0610 Voice of America (af/eu): VOA Sunday. See S 0010.
- 0615 BBC (af): Letter from America. See S 0030.
- 0615 BBC (am): On the Move. A weekly program about travel and transport with Malcolm Billings.
- 0615 BBC (as pac): Letter from America. See S 0030.
- 0615 BBC (eu): Letter from America. See S 0030.
- 0630 BBC (am): Meridian. Three topical programmes weekly about the world of the arts.
- 0630 BBC (as pac): Jazz for the Asking. Record requests with Malcolm Laylock.
- 0630 BBC (eu): Jazz for the Asking. See S 0630.

Mondays

- 0600 Voice of America (af): Daybreak Africa. See M 0300.
- 0610 Voice of America (eu): VOA Today. See S 2310.
- 0615 BBC (af): Network Africa. See M 0333.
- 0615 BBC (am): Concert Hall. See S 1415.
- 0615 BBC (as pac): Country Style. See S 1445.
- 0615 Radio Japan: Radio Japan Magazine Hour. See M 0315.
- 0616 Radio Japan: Sports Spotlight. See M 0316.
- 0625 Radio Japan: Japan Diary. See M 0325.
- 0630 Radio Japan: Close Up. See M 0330.
- 0633 BBC (af): Network Africa. See M 0333.
- 0647 Radio Japan: News Commentary. See M 0347.

Tuesdays

- 0600 Voice of America (af): Daybreak Africa. See M 0300.
- 0610 Voice of America (eu): VOA Today. See S 2310.
- 0615 BBC (af): Network Africa. See M 0333.
- 0615 BBC (am): Classical Music Feature. Opera Behind the Scenes (4th, 11th). Gordon Stewart talks to some of opera's major participants.
- 0615 BBC (as pac): Health Matters. See M 0445.
- 0615 BBC (eu): The World Today. See M 1645.
- 0615 Radio Japan: Radio Japan Magazine Hour. See M 0315.

- 0620 Radio Japan: Close Up. See M 0330.
- 0630 Radio Japan: Japanese Culture Today. See T 0330.
- 0633 BBC (af): Network Africa. See M 0333.
- 0645 Radio Japan: Japan Diary. See M 0325.
- 0650 Radio Japan: News Commentary. See M 0347.

Wednesdays

- 0600 Voice of America (af): Daybreak Africa. See M 0300.
- 0610 Voice of America (eu): VOA Today. See S 2310.
- 0615 BBC (af): Network Africa. See M 0333.
- 0615 BBC (eu): The World Today. See M 1645.
- 0615 Radio Japan: Radio Japan Magazine Hour. See M 0315.
- 0620 Radio Japan: Asian Report. See W 0320.
- 0630 BBC (am): Meridian. See S 0630.
- 0630 BBC (as pac): Meridian. See S 0630.
- 0630 BBC (eu): Megamix. See T 1615.
- 0630 Radio Japan: Close Up. See M 0330.
- 0633 BBC (af): Network Africa. See M 0333.
- 0641 Radio Japan: Japan Diary. See M 0325.
- 0647 Radio Japan: News Commentary. See M 0347.

Thursdays

- 0600 Voice of America (af): Daybreak Africa. See M 0300.
- 0610 Voice of America (eu): VOA Today. See S 2310.
- 0615 BBC (af): Network Africa. See M 0333.
- 0615 BBC (am): A Jolly Good Show. See S 0415.
- 0615 BBC (eu): The World Today. See M 1645.
- 0615 Radio Japan: Radio Japan Magazine Hour. See M 0315.
- 0630 Radio Japan: Crosscurrents. See H 0330.
- 0633 BBC (af): Network Africa. See M 0333.
- 0642 Radio Japan: Japan Diary. See M 0325.
- 0648 Radio Japan: News Commentary. See M 0347.

Fridays

- 0600 Voice of America (af): Daybreak Africa. See M 0300.
- 0610 Voice of America (eu): VOA Today. See S 2310.
- 0615 BBC (af): Network Africa. See M 0333.

- 0615 BBC (am): Country Style. See S 1445.
- 0615 BBC (as pac): On the Move. See S 0615.
- 0615 BBC (eu): The World Today. See M 1645.
- 0615 Radio Japan: Radio Japan Magazine Hour. See M 0315.
- 0630 BBC (am): Meridian. See S 0630.
- 0630 BBC (as pac): Meridian. See S 0630.
- 0630 Radio Japan: Close Up. See M 0330.
- 0633 BBC (af): Network Africa. See M 0333.
- 0642 Radio Japan: Japan Diary. See M 0325.
- 0648 Radio Japan: News Commentary. See M 0347.

Saturdays

- 0610 Radio Japan: This Week. See A 0310.
- 0610 Voice of America (af/eu): VOA Saturday. See S 0010.
- 0615 BBC (af): Seven Days. See A 0030.
- 0615 BBC (am): From the Weeklies. See A 0030.
- 0615 BBC (as pac): From the Weeklies. See A 0030.
- 0615 BBC (eu): The World Today. See M 1645.
- 0630 BBC (am): People and Politics. See S 0130.
- 0630 BBC (as pac): Meridian. See S 0630.
- 0631 BBC (af): Talkabout Africa. See W 1615.

Propagation Forecasting

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FREQUENCIES

0700-0800	Australia, Radio	5995as	6020pa	6080pa	9580pa
		9710pa	15240pa	15565as	17695as
0700-0730	Australia, Radio	13605as	15415as	17795as	
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	7385am	9400am		
0700-0710 s	Croatia, Croatian Radio	5895eu	7370eu	13830eu	
0700-0800	Ecuador, HCJB Quito	6135pa	6205as		
0700-0800 as	Eqt Guinea, R East Africa	9585af			
0700-0715	Ghana, Ghana Broadc Corp	3366do	4915do		
0700-0800 mtwh/vl	Italy, IRRS Milan	7125va			
0700-0800	Japan, NHK/Radio	5975eu	7230eu	11740as	11850as
		11955as	15335me	17810me	17815as
		21610au			
0700-0800	Kenya, Kenya Broadc Corp	4885do	4935do		
0700-0800 vl	Kiribati, Radio	9825do			
0700-0800 vl	Liberia, Radio ELBC	7275do			
0700-0800	Liberia, Radio ELWA	4760do			
0700-0800 asmtwh	Malaysia, Radio	7295do			
0700-0800	Malaysia, Voice of	6175as	9750as	15295as	
0700-0800	Monaco, Trans World Radio	7115eu			
0700-0730	Myanmar, Radio	5990do	9730do		
0700-0716 mtwhf	New Zealand, R NZ Intl	9570pa			
0700-0759 as	New Zealand, R NZ Intl	9570pa			
0700-0800	Palau, KHBN/Voice of Hope	9830as	17630as		
0700-0800 vl	Papua New Guinea, NBC	4890do	9675do		
0700-0715 s	Romania, R Romania Intl	11775pa	15335pa		
0700-0800	Russia, Voice of	13370as	15560as	17570as	17590as
		17695as	17870as		
0700-0715	Sierra Leone, SLBS	3316do			
0700-0800 vl	Solomon Islands, SIBC	5020do	9545do		
0700-0800	Swaziland, Swazi Radio	6155af			
0700-0800	Swaziland, Trans World R	5055af	6070af	9500af	9650af
0700-0800	Taiwan, VO Free China	5950na			
0700-0715 mtwfta	Uganda, Radio	4976do	7110do		
0700-0800	United Kingdom, BBC London	3955eu	6190af	6195eu	7325eu
		9410af	9600af	9640na	11760me
		11940af	11955as	12095af	15070af
		15280as	15310as	15360as	15400af
		17790as	17830af	17885af	
0700-0730	United Kingdom, BBC London	6005eu	11780eu	11860af	15575me
0700-0800	USA, KAIJ Dallas TX	5810am	9815am		
0700-0800	USA, KTBN Salt Lk City UT	7510am			
0700-0800	USA, KVOH Los Angeles CA	9785am			
0700-0800	USA, KWHR Naalehu HI	17780as			
0700-0800	USA, Monitor Radio Intl	7535eu			
0700-0800	USA, WHRI Noblesville IN	7315am	9495am		
0700-0800	USA, WINB Red Lion PA	11950na			
0700-0800	USA, WJCR Upton KY	7490na	13595na		
0700-0800 smtwhf	USA, WMLK Bethel PA	9465eu			
0700-0800 a	USA, WVHA Green Bush ME	7455eu			
0700-0800	USA, WWCR Nashville TN	5065am	5935am	7435am	
0700-0745	USA, WYFR Okeechobee FL	5985na	7355eu	9985eu	
0700-0759	USA, WYFR Okeechobee FL	13695af			
0700-0800	Zimbabwe, ZBC/Radio 3	5975do	6045do		
0702-0800 as	New Zealand, R NZ Intl	6100pa			
0717-0800 mtwhf	New Zealand, R NZ Intl	6100pa			
0730-0800	Australia, Radio	9660pa	9710pa	17880as	
0730-0800	Austria, R Austria Intl	6155eu	13730eu		
0730-0800 mtwhfa	Austria, R Austria Intl	15410me	17870me		
0730-0757	Czech Rep, Radio Prague	15640af			
0730-0800	Georgia, Radio	11805eu			
0730-0745 s	Greece, Voice of	9375au	9425eu	11645eu	
0730-0800	Netherlands, Radio	9700pa	9720au	11895pa	
0730-0745 mtwhf	Vatican State, Vatican R	4010eu	7250eu	9645eu	11740eu
		15210eu	15570eu		
0745-0800 s	Ghana, Ghana Broadc Corp	3366do	4915do		
0755-0800	Guam, AWR/KTWR	15200as			

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	9400am			
0800-0810 mtwhfa	Croatia, Croatian Radio	5895eu	7370eu	13830eu	
0800-0830	Ecuador, HCJB Quito	6135eu	6205eu		
0800-0900 as	Eqt Guinea, R East Africa	9585af			
0800-0830	Finland, YLE/Radio	15115au	17820as		
0800-0805 s	Ghana, Ghana Broadc Corp	3366do			
0800-0900	Guam, TWR/KTWR	15200as			
0800-0900 mtwh/vl	Italy, IRRS Milan	7125va			
0800-0900	Kenya, Kenya Broadc Corp	4885do	4935do		
0800-0900 vl	Kiribati, Radio	9825do			
0800-0900 vl	Liberia, Radio ELBC	7275do			
0800-0830	Liberia, Radio ELWA	4760do			
0800-0900	Malaysia, Radio	7295do			
0800-0830	Malaysia, Voice of	6175as	9750as	15295as	
0800-0805	Monaco, Trans World Radio	7115eu			
0800-0825	Netherlands, Radio	9720pa	9720au	11895pa	
0800-0900	New Zealand, R NZ Intl	6100pa			
0800-0830 m	Norway, Radio Norway Intl	15220me			
0800-0850	Pakistan, Radio	5625eu	17900eu		
0800-0900	Palau, KHBN/Voice of Hope	9830as	17630as		
0800-0900 vl	Papua New Guinea, NBC	4890do	9675do		
0800-0900	Russia, Voice of	9835as	11800as	11900as	13370as
		15560as	17590as	17695as	17765as
		17870as			
		3316do			
0800-0815	Sierra Leone, SLBS	3316do			
0800-0900 vl	Solomon Islands, SIBC	5020do	9545do		
0800-0900	South Korea, R Korea Intl	7550eu	13670me		
0800-0900	United Kingdom, BBC London	6190af	6195eu	7325eu	9740as
		11940af	11955as	12095af	15070af
		15280as	15360as	15400af	17640af
		17830af	17885af		
0800-0815	United Kingdom, BBC London	3955eu	9410eu	9600af	9640na
		11760me	15310eu	17790as	
		9815am			
0800-0900	USA, KAIJ Dallas TX	5810am			
0800-0900	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	7535eu			9425pa
0800-0900	USA, WEWN Birmingham AL	7425na			
0800-0900	USA, WHRI Noblesville IN	7315am	9495am		
0800-0900	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	5065am	5935am	7435am	
0800-0900	Zimbabwe, ZBC/Radio 4	5975do	6045do	7285do	
0805-0820 smtwhf	Monaco, Trans World Radio	7115eu			
0805-0835	Swaziland, Trans World R	5055af	6070af	9500af	9650af
0815-0900 mtwft	Nigeria, FRCN/Radio	3326do	4990do		
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	Netherlands, Radio	9720pa	9895pa	13700pa	
0830-0857	Slovakia, R Slovakia Intl	11990au	15640au	17485au	
0855-0900	Guam, TWR/KTWR	11830pa			

**HAUSER'S HIGHLIGHTS
RUSSIA: VOICE OF RUSSIA**

World Service
Z-95, selected programs

Russian by Radio Mon 0031, 1231, 2231, Tue 1031, 1631, Wed 0231, 0731, 1331, 2231, Thu 1031, 1631, Fri 0231, 0731 1331, Sun 0631, 1431

Science & Engineering Mon 0611, 1011, 1131, 2131, Tue 1611, Wed 0211, Thu 0911, 2011, Fri 0611, 2131, Sun 0511, 1311

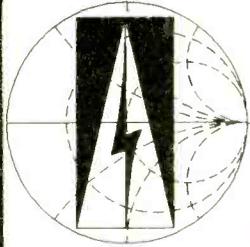
Audio Book Club Mon 0931, 1331, Tue 0231, 0731, 2231, Wed 1031, Thu 0231, 0731, 1331, 2231, Fri 1031, 1631, Sat 0231, 0731, 1331, Sun 0031, 1031, 2231

Folk Box Mon 1431, Tue 0131, 1131, Wed 0831, Thu 0431, 2031, Fri 1731, 2331, Sat 0831, Sun 2331

(Via Kevin Hecht, PA)

0800 UTC

0800-0900	Australia, AF Radio	15605af	18191af		
0800-0900	Australia, Radio	5995pa	6020pa	6080pa	9580pa
		9710pa	9860pa	17715as	21725as
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			



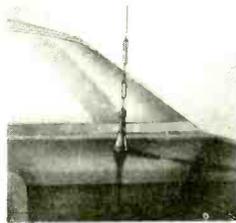
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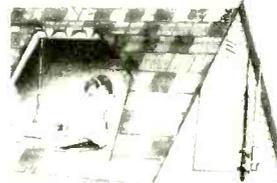
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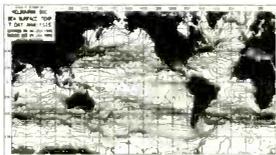
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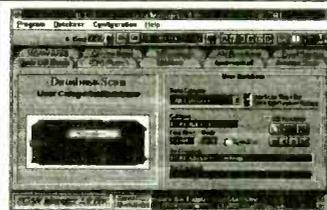
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- Print Professional Quality Reports from the Database
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FREQUENCIES

0900-1000	Australia, AF Radio	15605af	18191af		
0900-1000	Australia, Radio	5995as	7240as	9510as	9580pa
		9860pa	13605as	15170as	21725as
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			
0900-0925 mtwhfa	Belgium, R Vlaanderen Int	6035eu	15545af	17595af	
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		
0900-1000	Costa Rica, R Peace Intl	9400am			
0900-0910 s	Croatia, Croatian Radio	5895eu	7370eu	13830eu	
0900-1000	Ecuador, HCJB Quito	6135pa			
0900-1000 as	Eq Guinea, R East Africa	9585af			
0900-0950	Germany, Deutsche Welle	6160as	9565af	11715as	12055as
		15410af	17715as	17780as	21600af
		21680as			
0900-0915 mtwff	Ghana, Ghana Broadc Corp	3366do	4915do		
0900-1000	Guam, AWR/KSDA	9530as			
0900-0915	Guam, TWR/KTWR	15200as			
0900-1000	Guam, TWR/KTWR	11830pa			
0900-1000	Iraq, Radio Iraq Intl	13680as			
0900-1000 mtwh/vl	Italy, IRRS Milan	7125va			
0900-1000	Japan, NHK/Radio	9610as	11850au	15190as	
0900-0948 vl	Kiribati, Radio	9825do			
0900-1000 vl	Liberia, Radio ELBC	7275do			
0900-1000	Malaysia, Radio	7295do			
0900-0930	Netherlands, Radio	9720pa	13700pa		
0900-1000	New Zealand, R NZ Intl	6100pa			
0900-1000 mtwff	Nigeria, FRCN/Radio	3326do	4990do		
0900-1000	Nigeria, FRCN/Voice of	7255af			
0900-1000	Palau, KHBN/Voice of Hope	9830as	17630as		
0900-1000 vl	Papua New Guinea, NBC	4890do	9675do		
0900-1000	Russia, Voice of	9835as	11800as	11900as	17590as
		17695as	17765as	17870as	
0900-1000	Slovakia, AWR	15620af			
0900-1000 vl	Solomon Islands, SIBC	5020do	9545do		
0900-0930	Switzerland, Swiss R Intl	9885au	13685au	17515au	
0900-1000	United Kingdom, BBC London	6190af	6195as	9410eu	9740as
		11760me	11940af	12095af	15070af
		15190sa	15280as	15310as	15400eu
		15575me	17640af	17705af	17790as
		17830as	17885af		
0900-0915	United Kingdom, BBC London	6120as	6195eu	7345eu	9580as
		11955as	15360as		
		5810am	9815am		
0900-1000	USA, KAIJ Dallas TX	7510am			
0900-1000	USA, KTBN Salt Lk City UT	9930as			
0900-1000	USA, KWHR Naalehu HI	9930as			
0900-1000	USA, Monitor Radio Intl	7395sa	7535eu	9430as	13615pa
0900-1000	USA, WEWN Birmingham AL	7425na			
0900-1000	USA, WHRI Noblesville IN	7315am	9495am		
0900-1000	USA, WINB Red Lion PA	11950na			
0900-1000	USA, WJCR Upton KY	7490na	13595na		
0900-1000 smtwfhf	USA, WMLK Bethel PA	9465eu			
0900-1000 a	USA, WVHA Green Bush ME	9870af			
0900-1000	USA, WWCR Nashville TN	5065am	5935am	7435am	
0900-1000	Zimbabwe, ZBC/Radio 4	5975do	6045do	7285do	
0910-0940	Mongolia, R Ulan Bator	9960as	12000na		
0915-1000	Ghana, Ghana Broadc Corp	6130do	7295do		
0930-0945 s	Armenia, Voice of	15275eu	15370eu		
0930-1000 mtwhfa	Austria, R Austria Intl	6155eu	13730pa	17870pa	
0930-1000	Canada, CKZN St John's	6160do			
0930-1000	Netherlands, Radio	7260pa	9720pa	9810pa	21505pa
0930-1000	Philippines, FEBC/R Intl	11690as			

1000-1100	India, All India Radio	15050as	15180as	17387au	17895as
1000-1100	Iraq, Radio Iraq Intl	13680eu			
1000-1030	Israel, Kol Israel	15640na	15650eu	17575eu	
1000-1100 mtwh/vl	Italy, IRRS Milan	7125va			
1000-1100	Malaysia, Radio	7295do			
1000-1100	Malaysia, RTM/Kota Kinab	5980do			
1000-1030	Netherlands, Radio	7260pa	9720pa	9810pa	21505pa
1000-1100	New Zealand, R NZ Intl	6100pa			
1000-1100	Nigeria, FRCN/Radio	4990do	7285do		
1000-1100	Nigeria, FRCN/Voice of	7255af			
1000-1100	Palau, KHBN/Voice of Hope	9830as	17630as		
1000-1100 vl	Papua New Guinea, NBC	4890do	9675do		
1000-1100	Philippines, FEBC/R Intl	11690as			
1000-1100	Russia, Voice of	9835as	11800eu	11900as	13370as
		15110as	15405as	15510eu	17560as
		17590as	17765as	17870as	
1000-1030	Switzerland, Swiss R Intl	6165eu	9535eu		
1000-1015	Uganda, Radio	4976do			
1000-1100	United Kingdom, BBC London	6165eu	6190af	6195as	9410eu
		9740na	11760me	11940af	12095af
		15070af	15190sa	15310as	15400eu
		15575me	17640af	17705eu	17790as
		17830af	17885af		
1000-1030	United Kingdom, BBC London	15280as			
1000-1100	USA, KAIJ Dallas TX	9815am	9815am		
1000-1100	USA, KTBN Salt Lk City UT	7510am			
1000-1100	USA, KWHR Naalehu HI	9930as			
1000-1100	USA, Monitor Radio Intl	6095ca	7395sa	9430as	13625as
1000-1100	USA, VOA Washington DC	5985pa	7405am	9590am	11720pa
		11915am	15120am	15425pa	
1000-1100	USA, WEWN Birmingham AL	7425na			
1000-1100	USA, WHRI Noblesville IN	6040am	9495am		
1000-1100	USA, WINB Red Lion PA	11950na			
1000-1100	USA, WJCR Upton KY	7490na	13595na		
1000-1100	USA, WWCR Nashville TN	5065am	5935am	7435am	
1000-1100	USA, WYFR Okeechobee FL	5950na			
1000-1030	Vietnam, Voice of	9840as	12020as	15010as	
1020-1030 mtwfta	Vatican State, Vatican R	11740af	15210af	17585me	
1030-1100	Austria, R Austria Intl	17870pa			
1030-1100	Czech Rep, Radio Prague	7345eu	9505eu		
1030-1100	Malaysia, RTM/Kuching	7160do			
1030-1100	Netherlands, Radio	7260pa	9810pa		
1030-1100	South Korea, R Korea Intl	11715na			
1030-1100	Sri Lanka, SLBC Colombo	11835as	15120as	17850au	
1030-1100	UAE, Radio Dubai	13675eu	15320eu	15395eu	21605me

HAUSER'S HIGHLIGHTS

ROMANIA: RADIO ROMANIA INTERNATIONAL.

J-95 has some new program titles, 1-hour at 1430 to As, 1900 & 2100 Eu, next UT day 0200 to NAm on 11940, 9570, 9510, 6155, 5990, 0645 Pac, and repeated next weekday 1300 to Eu/NA on 17720, 15365, 11940

- Mon *Pages of Romanian Literature, Romanian Hits, Special Programme for Radio Amateurs*
- Tue *Romanian Anglicists, Youth Club*
- Wed *Women—the Other Force, Romanian Musicians, Partners in a Changing World*
- Thu *Listeners' Letterbox, Skylark*
- Fri *Radio Pictures, Romanian Folk Music at Its Best*
- Sat *World of Culture, Through Bucharest Along the Centuries or Point-Counterpoint, DX Mailbag*
- Sun *1300, 1900 Mon 0200: Sunday Studio (including Letterbox, Interviews, Miscellanea, Music); Romanian by Radio 1430, 2100, Mon 0645: Radio Tour—Romanian Itineraries, Letterbox, Skylark, Romanian by Radio*

Half-hour programs, 0400 on same as 0200, local days:

- Mon *Pro-Memoria*
- Tue *Business Club*
- Wed *Society*
- Thu *Citizens of the Same Country*
- Fri *European Opinions*
- Sat *The Week, World of Culture*
- Sun *Radio Tour—Romanian Itineraries*

1000 UTC

1000-1100	Australia, Radio	5995as	7240as	9580pa	9860pa
		15170as	21725as		
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		
1000-1100	Costa Rica, R Peace Intl	9400am			
1000-1100	Ecuador, HCJB Quito	6135as			
1000-1100 as	Eq Guinea, R East Africa	9585af			
1000-1040	Ghana, Ghana Broadc Corp	6130do	7295do		

FREQUENCIES

1300-1400	Australia, Radio	5995pa 11800pa	7240as	9560pa	9610as	1300-1400	United Kingdom, BBC London	5990as 7180na	6190af 9410eu	6195na 9515na	7110as 9740na
1300-1330	Australia, Radio	6060pa	6080as	9510pa		1300-1330	United Kingdom, BBC London	15105af			
1300-1400 vl	Australia, VLBA Alice Spg	2310do				1300-1400	USA, KAIJ Dallas TX	5810am	9815am		
1300-1400 vl	Australia, VL8K Katherine	2485do				1300-1400	USA, KJES Mesquite NM	11715na			
1300-1400 vl	Australia, VL8T Tent Crk	2325do				1300-1400	USA, KNLS Anchor Point AK	7365as			
1300-1400	Bahrain, Radio	6010do				1300-1400	USA, KTNB Salt Lk City UT	7510am			
1300-1335 mtwhfa	Belgium, R Vlaanderen Int	13670na				1300-1400	USA, Monitor Radio Intl	6095na	9355as	9455na	13625as
1300-1320	Brazil, Radiobras	15445na				1300-1400	USA, VOA Washington DC	6110as	9645as	9760as	11715as
1300-1400 vl	Canada, CBC N Quebec Svc	9625do				1300-1400	USA, WEWN Birmingham AL	7425na	11875na		
1300-1400	Canada, CFCX Montreal	6005do				1300-1400	USA, WHRI Noblesville IN	6040am	15105am		
1300-1400	Canada, CFRX Toronto	6070do				1300-1400	USA, WJCR Upton KY	7490na	13595na		
1300-1400	Canada, CFPV Calgary	6030do				1300-1400 s	USA, WRMI/R Miami Intl	9955am			
1300-1400	Canada, CHNX Halifax	6130do				1300-1400 a	USA, WVHA Green Bush ME	11695af			
1300-1400	Canada, CKZN St John's	6160do				1300-1400	USA, WWCR Nashville TN	5065am	13845am	15685am	
1300-1400	Canada, CKZU Vancouver	6160do				1300-1400	USA, WYFR Okeechobee FL	5950na	6015na	11830na	13695na
1300-1400 s	Canada, RCI Montreal	11955na	17820na			1300-1400	Zambia, Christian Voice	6065af			
1300-1400	China, China Radio Intl	7405na	9715as	15440pa		1330-1400	Austria, R Austria Intl	6155eu	13730eu	15450as	
1300-1400	Costa Rica, R Peace Intl	6200am	9400am	15050am		1330-1357	Canada, RCI Montreal	9535as	11795as		
1300-1400	Ecuador, HCJB Quito	12005am	15115am	21455eu		1330-1400	Canada, RCI Montreal	15315eu	15325eu	17820eu	17895eu
1300-1330	Egypt, Radio Cairo	17595as				1330-1400	Costa Rica, R Peace Intl	21455eu			
1300-1400 as	Eqt Guinea, R East Africa	9585af	4915do			1330-1400	Finland, YLE/Radio	9400am	15400na		
1300-1330	Ghana, Ghana Broadc Corp	3365do				1330-1400 tw	Ghana, Ghana Broadc Corp	4915do			
1300-1400 mtwh/vl	Italy, IRRS Milan	7125va				1330-1400	India, All India Radio	13732as	15120as		
1300-1400 mtwhfa	Lebanon, Wings of Hope	9960me				1330-1400	Moldova, R Moldova Intl	15315eu			
1300-1400 vl	Liberia, Radio ELBC	7275do				1330-1400	Netherlands, Radio	9895as	13700as	15150as	
1300-1400	Malaysia, Radio	7295do				1330-1400	Portugal, Radio	21515me			
1300-1400	Malaysia, RTM/Kota Kinab	5980do				1330-1400	Sweden, Radio	11650na	15240na		
1300-1400	Malaysia, RTM/Kuching	7160do				1330-1400	UAE, Radio Dubai	13675eu	15320eu	15395eu	21605me
1300-1325	Netherlands, Radio	6045eu	7130eu	7160eu		1330-1400	Uzbekistan, R Tashkent	6025eu	9715eu	13785eu	
1300-1400 occsnal	New Zealand, R NZ Intl	6100pa				1330-1400	Vietnam, Voice of	9840as	12020as	15010as	
1300-1350	North Korea, R Pyongyang	9345as	11740as			1335-1345	Greece, Voice of	15630na	17525na		
1300-1330 s	Norway, Radio Norway Intl	9590eu	11850na			1345-1400	Vatican State, Vatican R	11625as	12050as	15585pa	
1300-1400	Palau, KHBN Voice of Hope	9830as	9965as	17630as							
1300-1400	Palau, KHBN/Voice of Hope	9830as	9965as	17630as							
1300-1400 vl	Papua New Guinea, NBC	4890do	9675do								
1300-1400	Philippines, FEBC/R Intl	11995as									
1300-1400	Romania, R Romania Intl	11940eu	15365eu	17720eu							
1300-1400	Russia, Voice of	9540na	9800pa	9895as	11940as						
		13370as	17675as	17685as	17725as						
		17755as	17780as	17795as	17835as						
1300-1400	Singapore, SBC Radio One	6155do									
1300-1400	Singapore, R Singapore Intl	9530as									
1300-1330	Switzerland, Swiss R Intl	7230as	7480as	13635as	15545as	1400-1500	Australia, AF Radio	8743af	10621af		

SELECTED PROGRAMS

Sundays

- 1300 KTBN: Spiritual Protocol. Pastor Earl Paul preaches from Atlanta.
1310 Voice of America (as): Critic's Choice. See S 1110.
1330 Radio Austria Int I: Report from Austria. See S 0230
1340 Voice of America (as): Words and Their Stories (Special English). See S 0040.
1345 Voice of America (as): People in America (Special English). See S 0045.

Mondays

- 1300 KTBN: A New Perspective. Richard and Lindsay Roberts evangelize.
1310 Voice of America (as): Spotlight on Business and Finance. See S 1610.
1330 KTBN: John Hagee Today. Evangelizing by John Hagee of the Cornerstone Church in San Antonio, TX.
1330 Radio Austria Int I: Report from Austria. See S 0230.
1340 Voice of America (as): Development Report (Special English). See M 0040.
1345 Voice of America (as): This is America (Special English). See M 0045.

Tuesdays

- 1300 KTBN: A New Perspective. See M 1300.
1310 Voice of America (as): Inside USA. See M 1610.
1330 KTBN: John Hagee Today. See M 1330.
1330 Radio Austria Int I: Report from Austria. See S 0230.
1340 Voice of America (as): Agriculture Report (Special English). See T 0040.
1345 Voice of America (as): Science in the News (Special English). See T 0045.

Wednesdays

- 1300 KTBN: A New Perspective. See M 1300.
1310 Voice of America (as): International Focus. See T 1610.
1330 KTBN: John Hagee Today. See M 1330.

- 1330 Radio Austria Int I: Report from Austria. See S 0230.
1340 Voice of America (as): Science Report (Special English). See W 0040.
1345 Voice of America (as): Space and Man (Special English). See W 0045.

Thursdays

- 1300 KTBN: A New Perspective. See M 1300.
1310 Voice of America (as): Reporter's Notebook. See W 1610.
1330 KTBN: John Hagee Today. See M 1330.
1330 Radio Austria Int I: Report from Austria. See S 0230.
1340 Voice of America (as): Science Report (Special English). See W 0040.
1345 Voice of America (as): The Making of a Nation (Special English). See H 0045.

Fridays

- 1300 KTBN: A New Perspective. See M 1300.
1310 Voice of America (as): Perspectives. See H 1610.
1330 KTBN: John Hagee Today. See M 1330.
1330 Radio Austria Int I: Report from Austria. See S 0230.
1340 Voice of America (as): Environment Report (Special English). See F 0340.
1345 Voice of America (as): American Mosaic (Special English). See F 0345.

Saturdays

- 1300 KTBN: Flying House. A serialized cartoon program for children.
1310 Voice of America (as): Perspectives. See H 1610.
1330 KTBN: Becky's Barn. A puppet program for children.
1330 Radio Austria Int I: Report from Austria. See S 0230.
1340 Voice of America (as): In the News (Special English). See F 0040.
1345 Voice of America (as): American Stories (Special English). See F 0045.

HAUSER'S HIGHLIGHTS FRANCE: RADIO FRANCE INTERNATIONAL

1200-1300 UT on 13625, 15530

Mon-Fri *RFI Europe*

Mon *Arts in France, Sports*

Tue *France Today, Books, Science Probe*

Wed *The Bottom Line, Land of France*

Thu *Sports, The Americas North/South or Planet Earth*

Fri *Film Reel, Made in France*

Sat *Focus on France, Spotlight on Africa, French Lesson*

Sun *Asian Analysis or African Analysis, Paris Promenade, Every Woman or Counterpoint, Club 9516*

FREQUENCIES

1400-1430	Australia, Radio	5995pa	7240pa	9560as	9610pa	1400-1500	Russia, Voice of	9595as	11835as	11910as	11935as
1400-1500 vl	Australia, VL8A Alice Spg	11695pa	11800pa			1400-1500	Singapore, SBC Radio One	11945sa	11985me	12025as	13770as
1400-1500 vl	Australia, VL8K Katherine	2310do				1400-1500	Slovakia, AWR	15320me	15425me	17570af	17710me
1400-1500 vl	Australia, VL8T Tent Crk	2485do				1400-1500	United Kingdom, BBC London	6155do			
1400-1500	Bahrain, Radio	2325do				1400-1500		13595am			
1400-1500 vl	Canada, CBC N Quebec Svc	6010do				1400-1500		5990as	6190af	6195as	7110as
1400-1500	Canada, CFCX Montreal	9625do				1400-1500		7180as	9410eu	9515na	9660as
1400-1500	Canada, CFRX Toronto	6005do				1400-1500		9740na	11750as	11865af	11940af
1400-1500	Canada, CFPV Calgary	6070do				1400-1500		12095af	15070af	15575me	17640af
1400-1500	Canada, CHNX Halifax	6030do				1400-1500		17705eu	17830af	17840na	21470af
1400-1500	Canada, CKZN St John's	6130do				1400-1500	USA, KAIJ Dallas TX	21660af			
1400-1500	Canada, CKZU Vancouver	6160do				1400-1500	USA, KJES Mesquite NM	5810am	9815am		
1400-1500 s	Canada, RCI Montreal	6160do				1400-1500	USA, KTVN Salt Lk City UT	11715na			
1400-1500	China, China Radio Intl	11955na	17820na			1400-1500	USA, Monitor Radio Intl	7510am			
1400-1500	China, China Radio Intl	7405na	9535as	9785as		1400-1500	USA, VOA Washington DC	9355as			
1400-1500	Costa Rica, R Peace Intl	6200am	9400am	15050am		1400-1500		6110as	7215as	9645as	9760as
1400-1500 as	Eq Guinea, R East Africa	9585af				1400-1500		15160as	15255as	15395as	15425as
1400-1500	France, Radio France Intl	7110as	15405me	17560me		1400-1500	USA, WEWN Birmingham AL	7425na	11875na		
1400-1420	Ghana, Ghana Broadc Corp	3366do	4915do			1400-1500	USA, WHRI Noblesville IN	6040am	15105am		
1400-1500	India, All India Radio	13732as	15120as			1400-1500	USA, WINB Red Lion PA	15715eu			
1400-1500 mtwh/vl	Italy, IRRS Milan	7125va				1400-1500	USA, WJCR Upton KY	7490na	13595na		
1400-1500	Japan, NHK/Radio	9535na	11705na	11895as	11915as	1400-1500	USA, WRNO New Orleans LA	15420am			
1400-1500 mtwhfa	Lebanon, Wings of Hope	9960me				1400-1500 a	USA, WVHA Green Bush ME	11695af			
1400-1500 vl	Liberia, Radio ELBC	7275do				1400-1500	USA, WWCR Nashville TN	12160am	13845am	15685am	
1400-1500	Malaysia, Radio	7295do				1400-1500	USA, WYFR Okeechobee FL	6015na	11830na	17750na	
1400-1500	Malaysia, RTM/Kota Kinab	5980do				1415-1500 mtwfta	Bhutan, Bhutan BC Service	5025do			
1400-1500	Malaysia, RTM/Kuching	7160do				1420-1500	Jordan, Radio	15270eu			
1400-1500 mtwhfa	Malta, V of Mediterranean	11925me				1430-1500	Australia, Radio	6060pa	6080pa	7260as	9710pa
1400-1435 s	Malta, V of Mediterranean	11925me						11660as	11695pa		
1400-1425 mtwhfa	Moldova, R Moldova Intl	11580eu				1430-1500	Ecuador, HCJB Quito	6080am	12005am	15115am	15295am
1400-1500 s	Morocco, RTV Marocaine	17575af						15540am	21455eu		
1400-1500	Netherlands, Radio	9890as	13700as	15150as		1430-1500 s	Ghana, Ghana Broadc Corp	3366do			
1400-1500 occsnal	New Zealand, R NZ Intl	6100pa				1430-1500	Myanmar, Radio	5990do	7185do		
1400-1405	Nigeria, FRCN/Radio	4990do	7285do			1430-1500 mtwhf	Portugal, Radio	21515me			
1400-1500	Palau, KHBN/Voice of Hope	9830as	9965as	17630as		1430-1500	Romania, R Romania Intl	11775as	15335as	17720as	
1400-1500	Philippines, FEBC/R Intl	11995as				1445-1500	Mongolia, R Ulan Bator	7293as	9950as	12000na	

SELECTED PROGRAMS

Sundays

- 1405 BBC (am): Arts Feature. Writers in a Nutshell (2nd,9th). See S 0005.
- 1405 BBC (as pac): Write On. See S 0145.
- 1410 Radio Japan: Let's Learn Japanese. See S 0310.
- 1410 Voice of America (as): The Concert Hall. Classical music and interviews with America's great artists and conductors.
- 1415 BBC (am): Music Review. News and views from the world of music.
- 1415 BBC (as pac): Concert Hall. Classical music concerts.
- 1425 Radio Japan: Media Roundup. See S 0525.
- 1445 BBC (af): Country Style. With David Allan.
- 1450 Radio Japan: Viewpoint. See S 0550.
- 1455 Radio Japan: Tokyo Pop-In. See S 0155.
- 1455 Voice of America (as): VOA Editorial. Comments expressing the official position of the U.S. Government on various subjects.

Mondays

- 1405 BBC (af): Outlook. An up-to-the-minute mix of conversation, controversy and color from around the world.
- 1405 BBC (am): Outlook. See M 1405.
- 1405 BBC (as pac): Outlook. See M 1405.
- 1405 BBC (eu): Outlook. See M 1405.
- 1410 Voice of America (as): Asia Report. Correspondents' reports and background on the news, with emphasis on events in East and South Asia.
- 1415 Radio Japan: Radio Japan Magazine Hour. See M 0315.
- 1420 Radio Japan: Close Up. See M 0330.
- 1430 BBC (af): John Peel. See S 0530.
- 1430 BBC (am): Omnibus. See M 1130.
- 1430 BBC (as pac): Health Matters. See M 0445.
- 1430 BBC (eu): John Peel. See S 0530.
- 1430 Radio Japan: Sports Spotlight. See M 0316.
- 1440 Radio Japan: Japan Diary. See M 0325.
- 1446 Radio Japan: News Commentary. See M 0347.
- 1455 Radio Japan: Tokyo Pop-In. See S 0155.
- 1455 Voice of America (as): VOA Editorial. See S 1455.

Tuesdays

- 1405 BBC (af): Outlook. See M 1405.
- 1405 BBC (am): Outlook. See M 1405.
- 1405 BBC (as pac): Outlook. See M 1405.
- 1405 BBC (eu): Outlook. See M 1405.
- 1410 Voice of America (as): Asia Report. See M 1410.

- 1415 Radio Japan: Radio Japan Magazine Hour. See M 0315.
- 1420 Radio Japan: Close Up. See M 0330.
- 1430 BBC (af): Multitrack: Hit List. See M 1615.
- 1430 BBC (am): Health Matters. See M 0445.
- 1430 BBC (as pac): Discovery. See T 0230.
- 1430 BBC (eu): Multitrack: Hit List. See M 1615.
- 1430 Radio Japan: Japanese Culture Today. See T 0330.
- 1445 Radio Japan: Japan Diary. See M 0325.
- 1450 Radio Japan: News Commentary. See M 0347.
- 1455 Radio Japan: Tokyo Pop-In. See S 0155.
- 1455 Voice of America (as): VOA Editorial. See S 1455.

Wednesdays

- 1405 BBC (af): Outlook. See M 1405.
- 1405 BBC (am): Outlook. See M 1405.
- 1405 BBC (as pac): Outlook. See M 1405.
- 1405 BBC (eu): Outlook. See M 1405.
- 1410 Voice of America (as): Asia Report. See M 1410.
- 1415 Radio Japan: Radio Japan Magazine Hour. See M 0315.
- 1420 Radio Japan: Asian Report. See W 0320.
- 1430 BBC (af): Megamix. See T 1615.
- 1430 BBC (am): Country Style. See S 1445.
- 1430 BBC (as pac): Omnibus. See M 1130.
- 1430 BBC (eu): Megamix. See T 1615.
- 1430 Radio Japan: Close Up. See M 0330.
- 1441 Radio Japan: Japan Diary. See M 0325.
- 1445 BBC (am): Good Books. See M 0030.
- 1447 Radio Japan: News Commentary. See M 0347.
- 1455 Radio Japan: Tokyo Pop-In. See S 0155.
- 1455 Voice of America (as): VOA Editorial. See S 1455.

Thursdays

- 1405 BBC (af): Outlook. See M 1405.
- 1405 BBC (am): Outlook. See M 1405.
- 1405 BBC (as pac): Outlook. See M 1405.
- 1405 BBC (eu): Outlook. See M 1405.
- 1410 Voice of America (as): Asia Report. See M 1410.
- 1415 Radio Japan: Radio Japan Magazine Hour. See M 0315.
- 1430 BBC (af): Multitrack: X-Press. See W 1615.
- 1430 BBC (am): Network UK. Issues and events affecting the lives of people throughout the UK.
- 1430 BBC (as pac): Assignment. See H 0130.
- 1430 BBC (eu): Multitrack: X-Press. See W 1615.
- 1430 Radio Japan: Crosscurrents. See H 0330.
- 1442 Radio Japan: Japan Diary. See M 0325.

- 1448 Radio Japan: News Commentary. See M 0347.
- 1455 Radio Japan: Tokyo Pop-In. See S 0155.
- 1455 Voice of America (as): VOA Editorial. See S 1455.

Fridays

- 1405 BBC (af): Outlook. See M 1405.
- 1405 BBC (am): Outlook. See M 1405.
- 1405 BBC (as pac): Outlook. See M 1405.
- 1405 BBC (eu): Outlook. See M 1405.
- 1410 Voice of America (as): Asia Report. See M 1410.
- 1415 Radio Japan: Radio Japan Magazine Hour. See M 0315.
- 1430 BBC (af): Multitrack: Alternative. Latest developments on the British music scene.
- 1430 BBC (eu): Multitrack: Alternative. See F 1430.
- 1430 Radio Japan: Close Up. See M 0330.
- 1442 Radio Japan: Japan Diary. See M 0325.
- 1445 BBC (am): The Farming World. See M 0015.
- 1448 Radio Japan: News Commentary. See M 0347.
- 1455 Radio Japan: Tokyo Pop-In. See S 0155.
- 1455 Voice of America (as): VOA Editorial. See S 1455.

Saturdays

- 1410 Radio Japan: This Week. See A 0310.
- 1410 Voice of America (as): Music USA (Jazz). Willis Conover hosts the VOA jazz hour.
- 1450 BBC (eu): Write On. See S 0145.
- 1455 Voice of America (as): VOA Editorial. See S 1455.

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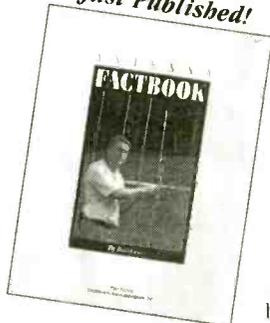
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FREQUENCIES

1700-1800	Australia, Radio	6060pa 9580pa 11695pa	6080pa 9710pa 11880pa	6090pa 9860pa	7260as 11660pa	1800-1830 1800-1900	Albania, R Tirana Intl Australia, Radio	7230eu 6060pa 6080pa 11660as	9730eu 6090pa 9580pa 11880pa
1700-1800 vl	Australia, VL8A Alice Spg	2310do				1800-1900 vl	Australia, VL8A Alice Spg	2310do	
1700-1800 vl	Australia, VL8K Katherine	2485do				1800-1900 vl	Australia, VL8T Tent Crk	2325do	
1700-1800 vl	Australia, VL8T Tent Crk	2325do				1800-1900	Bahrain, Radio	6010do	
1700-1800	Azerbaijan, Voice of	7160eu				1800-1845	Bangladesh, Radio	7190eu	9683eu
1700-1800	Bahrain, Radio	6010do				1800-1825	Belgium, R Vlaanderen Int	5910eu	
1700-1800	Canada, CFCX Montreal	6005do				1800-1900	Canada, CFCX Montreal	6005do	
1700-1800	Canada, CFRX Toronto	6070do				1800-1900	Canada, CFRX Toronto	6070do	
1700-1800	Canada, CFVP Calgary	6030do				1800-1900	Canada, CFVP Calgary	6030do	
1700-1800	Canada, CHNX Halifax	6130do				1800-1900	Canada, CHNX Halifax	6130do	
1700-1800	Canada, CKZN St John's	6160do				1800-1900	Canada, CKZN St John's	6160do	
1700-1800	Canada, CKZU Vancouver	6160do				1800-1900	Canada, CKZU Vancouver	6160do	
1700-1800	China, China Radio Intl	7405af	9535as	11575af		1800-1900	Costa Rica, R Peace Intl	6200am	9400am 15050am
1700-1800 as	Costa Rica, AWR Alajuela	13750am				1800-1900	Ecuador, HCJB Quito	6080am	12005am 15115am 15540am
1700-1800	Costa Rica, R Peace Intl	6200am	9400am	15050am					
1700-1727	Czech Rep, Radio Prague	5930as	15640af			1800-1830	Egypt, Radio Cairo	15255af	
1700-1800	Ecuador, HCJB Quito	6080am	12005am	15115am	15540am	1800-1830	Ghana, Ghana Broadc Corp	3366do	4915do
		21455eu				1800-1845	India, All India Radio	7412eu	9650me 9950me 11620eu
		15255af						11935af	13750as 15075me
1700-1800	Egypt, Radio Cairo	7125va				1800-1900 mtwh/vl	Italy, IRRS Milan	7125va	
1700-1800 mtwh/vl	Italy, IRRS Milan	6150na	9535na	9580as	11840as	1800-1900	Kenya, Kenya Broadc Corp	4885do	4935do
1700-1800	Japan, NHK/Radio	11930as				1800-1900	Kuwait, Radio	11990na	
		15270eu				1800-1830 mtwhfa	Lebanon, Voice of	6550eu	
1700-1730	Jordan, Radio	7275do				1800-1900	Liberia, Radio ELBC	7275do	
1700-1800 vl	Liberia, Radio ELBC	6100pa				1800-1900	Liberia, Radio ELWA	4760do	
1700-1800	New Zealand, R NZ Intl	3326do	4990do			1800-1830	Netherlands, Radio	6020af	9605af 11655af
1700-1800	Nigeria, FRCN/Radio	9325eu	9640af	9977af	13785eu	1800-1849 mtwhf	New Zealand, R NZ Intl	6100pa	
1700-1750	North Korea, R Pyongyang	7485eu	11570eu			1800-1830	Nigeria, FRCN/Radio	3326do	4990do
1700-1750	Pakistan, Radio	9830as	9965as	17630as		1800-1830 s	Norway, Radio Norway Intl	5960eu	13805af 15220af
1700-1800	Palau, KHBN/Voice of Hope	6095eu	7270eu	7285eu		1800-1900	Palau, KHBN/Voice of Hope	9830as	9965as 17630as
1700-1800	Poland, Polish R Warsaw	9480eu	9880af	11630eu	11715me	1800-1900	Russia, Voice of	7350eu	9480eu 9755as 9880eu
1700-1800	Russia, Voice of	11890as	11960af	11990eu	12065me			11630eu	11675eu 11715me 11775as
		15105as	15480as	17570af	17875af			11890as	11910as 11945sa 11960af
		21740af						15105as	
1700-1800	S Africa, Channel Africa	3220af	7240af			1800-1830	S Africa, Trans World R	9500af	
1700-1800	S Africa, Trans World R	9500af				1800-1900 irreg	Sudan, Sudan Natl BC	9200af	
1700-1800	Slovakia, AWR	13595am	15620am			1800-1900	Swaziland, Trans World R	3200af	
1700-1730	Switzerland, Swiss R Intl	9885af	9905eu	12075me	13635me	1800-1900	United Kingdom, BBC London	3955eu	6005af 6180eu 6190af
1700-1720	Uganda, Radio	4976do						6195eu	9410eu 9630af 9740as
1700-1800	United Kingdom, BBC London	3955eu	5975as	6005af	6180eu			11955as	12095eu 15070af 15400af
		6190af	6195eu	9410eu	9510as			15420af	17830af
		9630af	9740as	11750as	11775as			5975as	7160me 9510as 11940af
		11940af	12095af	15070af	15400af			13815am	15725am
		15420af	17830af					15385na	
1700-1715	United Kingdom, BBC London	9515na	15260na			1800-1830	United Kingdom, BBC London	15590am	
1700-1745	United Kingdom, BBC London	3915as				1800-1900	USA, KAIJ Dallas TX	13625au	
1700-1800	USA, KAIJ Dallas TX	13815am	15725am			1800-1900	USA, KJES Mesquite NM	9355me	13770me 15665eu 17510af
1700-1800	USA, KTBN Salt Lk City UT	15590am				1800-1900	USA, KTBN Salt Lk City UT	3980eu	4875af 6040eu 9760eu
1700-1800	USA, KWHR Naalehu HI	6120as				1800-1900	USA, KWHR Naalehu HI	9770af	11920af 12040af 13680af
1700-1800	USA, Monitor Radio Intl	9355af	17510af			1800-1900	USA, Monitor Radio Intl	13710af	15205af 15410af 15580af
1700-1800	USA, VOA Washington DC	3980eu	5900as	5990eu	6045as			17895af	19379me
		6110as	7150as	7170as	7215as			7425eu	13615na
		9525as	9645as	9690af	9700eu	1800-1900	USA, WHRI Noblesville IN	9495am	13760eu
		9760af	9770af	11870as	11895af	1800-1900	USA, WINB Red Lion PA	15715eu	
		11920af	11945af	12040af	13710af	1800-1900	USA, WJCR Upton KY	7490na	13595na
		15205as	15410af	15445af	17895af	1800-1900	USA, WMLK Bethel PA	9465eu	
		19379me				1800-1900 as/vl	USA, WRMI/R Miami Intl	9955am	
1700-1800	USA, WEWN Birmingham AL	7425na	13615na			1800-1900	USA, WRNO New Orleans LA	15420am	
1700-1800	USA, WHRI Noblesville IN	13760am	15105am			1800-1900 s	USA, WVHA Green Bush ME	13720af	
1700-1800	USA, WINB Red Lion PA	15715eu				1800-1900 mwf	USA, WVHA Green Bush ME	15745af	
1700-1800	USA, WJCR Upton KY	7490na	13595na			1800-1900 th	USA, WVHA Green Bush ME	13720eu	
1700-1800 smtwhf	USA, WMLK Bethel PA	9465eu				1800-1900	USA, WWCR Nashville TN	12160am	13845am 15685am
1700-1800 as/vl	USA, WRMI/R Miami Intl	9955am				1800-1900	USA, WYFR Okeechobee FL	21500eu	21745eu
1700-1800	USA, WRNO New Orleans LA	15420am				1800-1830	Vietnam, Voice of	9840eu	12020eu
1700-1800 mwf	USA, WVHA Green Bush ME	17612af				1800-1900	Yemen, Yemeni Rep Radio	9780as	
1700-1800	USA, WWCR Nashville TN	12160am	13845am	15685eu		1800-1900	Zambia, Christian Voice	4965af	
1700-1800	USA, WYFR Okeechobee FL	21500eu	21745eu			1800-1900	Zimbabwe, ZBC/Radio 4	3306do	3396do 4828do
1700-1800	Zambia, Christian Voice	4965af				1830-1900	Kazakhstan, Radio Almaty	5035eu	5260eu 5940eu 5960eu
1700-1800	Zimbabwe, ZBC/Radio 4	3306do	3396do	4828do				5970eu	
1705-1800	Ghana, Ghana Broadc Corp	3366do						6015af	6020af 9605af 9860af
1715-1800	United Kingdom, BBC London	7160me						9895af	15315af 17605af
1730-1800	Austria, R Austria Intl	9665me	11780as			1830-1845	Rwanda, Radio	6055do	
1730-1800	Moldova, R Moldova Intl	7235eu				1830-1857	S Africa, Trans World R	9525af	
1730-1800	Netherlands, Radio	6020af	9605af	11655af		1830-1900	Slovakia, R Slovakia Intl	5915eu	6055eu 7345eu
1730-1800	Romania, R Romania Intl	11830af	15340af	15365af	17805af	1830-1900	United Kingdom, BBC London	3255af	
1730-1800	Sweden, Radio	6065eu	13605me	15600af		1830-1900	Yugoslavia, Radio	6100eu	9720af
1730-1800	Vatican State, Vatican R	7305af	9695af	9725af	11625af	1833-1900	Cote D' Ivoire, RDTV	11920do	
1745-1800	Armenia, Voice of	4810eu	4990eu	7480eu		1840-1850	Greece, Voice of	11645af	15650af
1745-1800	Bangladesh, Radio	7190eu	9683eu			1845-1900 irreg s	Mali, RDTV Malienne	4783do	4835do 5995do
1745-1800	India, All India Radio	7412eu	9650me	9950me	11620eu	1850-1900	New Zealand, R NZ Intl	11910pa	
		11935af	13750as	15075me					
1745-1800 mtwhf	Swaziland, Trans World R	3200af							

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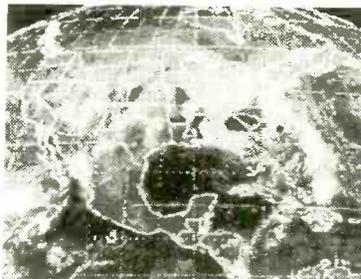
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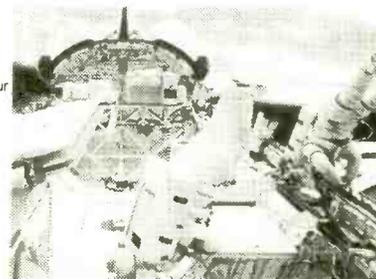


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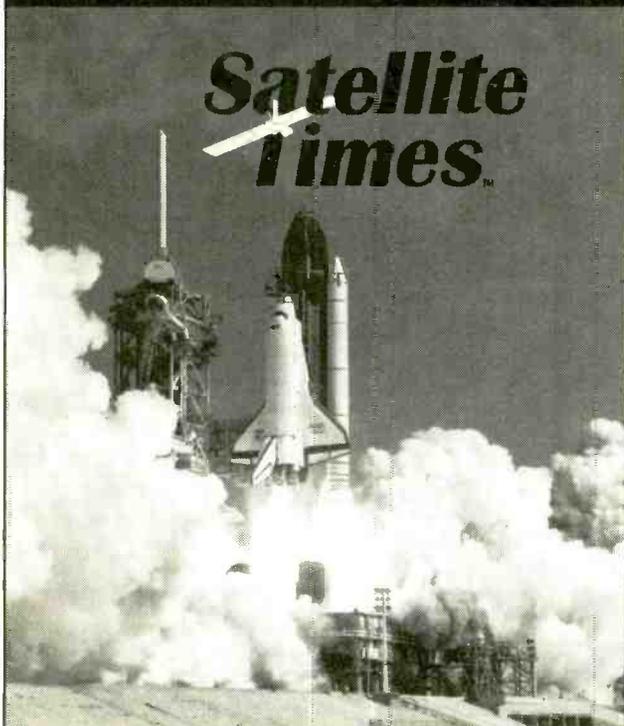
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FREQUENCIES

1900-2000 mtwhf	Argentina, RAE	15345eu				2000-2100	Algeria, R Algiers Intl	11715eu			
1900-2000	Australia, Radio	6060pa	6080pa	6150as	7240pa	2000-2100	Australia, Radio	6060pa	6080pa	6150pa	7260as
	7260as	9560as	9580pa	11660pa	11695pa			9580pa	9860pa	11660pa	11695pa
	11880pa							11855as	11880pa		
1900-2000 vl	Australia, VL8A Alice Spg	2310do				2000-2100 vl	Australia, VL8A Alice Spg	2310do			
1900-2000 vl	Australia, VL8K Katherine	2485do				2000-2100 vl	Australia, VL8K Katherine	2485do			
1900-2000 vl	Australia, VL8T Tent Crk	2325do				2000-2100 vl	Australia, VL8T Tent Crk	2325do			
1900-2000	Bahrain, Radio	6010do				2000-2100	Bahrain, Radio	6010do			
1900-2000	Brazil, Radiobras	15268eu				2000-2020	Brazil, Radiobras	15268eu			
1900-2000	Bulgaria, Radio	9700eu	11720eu			2000-2100 vl	Canada, CBC N Quebec Svc	9625do			
1900-2000	Canada, CFCX Montreal	6005do				2000-2100	Canada, CFCX Montreal	6005do			
1900-2000	Canada, CFRX Toronto	6070do				2000-2100	Canada, CFRX Toronto	6070do			
1900-2000	Canada, CFVP Calgary	6030do				2000-2100	Canada, CFVP Calgary	6030do			
1900-2000	Canada, CHNX Halifax	6130do				2000-2100	Canada, CHNX Halifax	6130do			
1900-2000	Canada, CKZN St John's	6160do				2000-2100	Canada, CKZN St John's	6160do			
1900-2000	Canada, CKZU Vancouver	6160do				2000-2100	Canada, CKZU Vancouver	6160do			
1900-2000	Costa Rica, AWR Alajuela	13750am	15460am			2000-2100	Canada, RCI Montreal	5995eu	7235eu	11985eu	13650eu
1900-2000	Costa Rica, R Peace Intl	6200am	9400am	15050am	17910am			13670eu	15150eu	15325eu	17820eu
1900-1930	Cote D' Ivoire, RDTV	11920do				2000-2100	China, China Radio Intl	6950eu	9440af	9920eu	15110af
1900-2000	Ecuador, HCJB Quito	6080am	12005am	15115am	15540am	2000-2100	Costa Rica, R Peace Intl	6200am			
		21455eu				2000-2027	Czech Rep, Radio Prague	5930eu	11640pa		
1900-1930	Finland, YLE/Radio	9730eu	15440af			2000-2100	Ecuador, HCJB Quito	6080am	12005am	15540am	
1900-1950	Germany, Deutsche Welle	7170af	9670af	9735af	11740af	2000-2100	Eq Guinea, Radio Africa	15186af			
		11785af	13690af	13790af		2000-2050	Germany, Deutsche Welle	7170eu	9615eu		
		5980am				2000-2030	Ghana, Ghana Broadc Corp	3366do	4915do		
1900-2000	Guatemala, AWR	5980am				2000-2010	Greece, Voice of	9375eu			
1900-1930	Hungary, Radio Budapest	3955eu	6140eu	7130eu	9835eu	2000-2100	Guatemala, AWR	5980am			
1900-1945	India, All India Radio	7412eu	9650me	9950me	11620eu	2000-2100	Indonesia, Voice of	9675as			
		11935af	13750as	15075me		2000-2030	Iran, VOIRI Tehran	7260af	9022eu		
		9435eu	11603na	11685na		2000-2015 mtwh/vl	Italy, IRRS Milan	7125va			
1900-1910	Israel, Kol Israel	7465na				2000-2100	Kenya, Kenya Broadc Corp	4885do	4935do		
		15640af				2000-2100	Kuwait, Radio	11990eu			
1900-2000 mtwh/vl	Italy, IRRS Milan	7125va				2000-2100	Liberia, Radio ELBC	7275do			
1900-2000	Japan, NHK/Radio	6150as	7140au	9535na	9580au	2000-2100	Liberia, Radio ELWA	4760do			
		11850au				2000-2025	Netherlands, Radio	6020af	9605af	9860af	9895af
1900-2000	Kenya, Kenya Broadc Corp	4885do	4935do					11655af	15315af	17605af	
1900-2000	Kuwait, Radio	11990eu				2000-2050	New Zealand, R NZ Intl	11910pa			
1900-2000	Liberia, Radio ELBC	7275do				2000-2005	Nigeria, FRCN/Radio	3326do	4990do		
1900-2000	Liberia, Radio ELWA	4760do				2000-2100	Nigeria, FRCN/Voice of	7255af			
1900-1925	Netherlands, Radio	6015af	6020af	9605af	9860af	2000-2050	North Korea, R Pyongyang	6576eu	9345as	9640af	9977na
		9895af	15315af	17605af		2000-2100	Palau, KHBN/Voice of Hope	9830as	9965as		
1900-2000	New Zealand, R NZ Intl	11910pa				2000-2100 vl	Papua New Guinea, NBC	4890do	9675do		
1900-2000	Nigeria, FRCN/Voice of	7255af				2000-2030	Poland, Polish R Warsaw	6095eu	6135eu	7285eu	
1900-2000	Palau, KHBN/Voice of Hope	9830as	9965as	17630as		2000-2030 mtwhf	Portugal, Radio	6130af	9780eu	9815eu	15515af
1900-2000 vl	Papua New Guinea, NBC	4890do	9675do			2000-2100	Russia, Voice of	7350eu	9480eu	9755as	9880eu
1900-1930	Portugal, Radio	6130eu	9780eu	9815eu	15515af			11630eu	11675eu	11730na	11890as
1900-2000	Romania, R Romania Intl	9690eu	9750eu	11810eu	11940eu	2000-2100 vl	Solomon Islands, SIBC	5020do			
1900-2000	Russia, Voice of	7350eu	9480eu	9755as	9865af	2000-2015	Swaziland, Trans World R	3200af			
		9880eu	11630eu	11675eu	11775as	2000-2030	Switzerland, Swiss R Intl	9770af	9885af	11640af	13635af
		11890as	11910as	11945as	11990af	2000-2100	Turkey, Voice of	9445eu			
		15105as	15480as	17570af	17875af	2000-2015	Uganda, Radio	4976do	5026do		
1900-1915	Rwanda, Radio	6055af				2000-2030	United Kingdom, BBC London	6190af	7160me	9630af	12095me
1900-2000	Slovakia, AWR	15620am						15070af	17830af		
1900-2000	South Korea, R Korea Intl	5975eu	6480eu	7275as		2000-2100	United Kingdom, BBC London	3255af	3955eu	6005af	6180eu
1900-2000	Swaziland, Trans World R	3200af						6195eu	7325eu	9410eu	9740as
1900-1930	Switzerland, Swiss R Intl	6165eu				2000-2100	USA, KAIJ Dallas TX	11750sa	11955sa	15400af	
1900-2000	Thailand, Radio	9555eu						13815am	15725am		
1900-1915	Uganda, Radio	4976do	5026do			2000-2100	USA, KATN Salt Lk City UT	15590am			
1900-2000	United Kingdom, BBC London	3255af	3955eu	6005af	6180eu	2000-2100 as	USA, KVOH Los Angeles CA	17775am			
		6190af	7160me	9630af	12095me	2000-2100	USA, KWHR Naalehu HI	15405as			
		11955as	12095me	15070af	17830af	2000-2100	USA, Monitor Radio Intl	13770eu	15665eu		
1900-2000	USA, KAIJ Dallas TX	13815am	15725am			2000-2100	USA, VOA Washington DC	6040eu	7375af	7415af	9760af
1900-2000	USA, KATN Salt Lk City UT	15590am						9770af	11855af	13710af	15205me
1900-2000 as	USA, KVOH Los Angeles CA	17775am				2000-2100	USA, WEWN Birmingham AL	15410af	15445af	15580af	17725af
1900-2000	USA, KWHR Naalehu HI	13625au						17755af	19379me		
1900-2000	USA, Monitor Radio Intl	15665eu	17510af			2000-2100	USA, WHRI Noblesville IN	7425na	13615na	15375eu	
1900-2000	USA, VOA Washington DC	3980eu	6040eu	7375af	7415af	2000-2100	USA, WINB Red Lion PA	9495am	13760eu		
		9525pa	9760af	9770af	11870as	2000-2100	USA, WJCR Upton KY	15715eu			
		11920af	12040af	15180as	15205af	2000-2100	USA, WMLK Bethel PA	9465eu			
		15410af	15445af	15580af	19379me	2000-2100 as/vl	USA, WRMI/R Miami Intl	9955am			
		7490na	13595na			2000-2100	USA, WRNO New Orleans LA	15420am			
1900-2000	USA, WJCR Upton KY	9465eu				2000-2100 as	USA, WVHA Green Bush ME	13720eu			
1900-2000	USA, WMLK Bethel PA	9465eu				2000-2100	USA, WWCR Nashville TN	12160am	13845am	15685am	
1900-2000 as/vl	USA, WRMI/R Miami Intl	9955am				2000-2100	USA, WYFR Okeechobee FL	21745eu			
1900-2000	USA, WRNO New Orleans LA	15420am				2000-2030	Vatican State, Vatican R	4005eu	7355af	9645af	11625af
1900-2000 s	USA, WVHA Green Bush ME	15745af				2000-2100	Zambia, Christian Voice	4965af			
1900-2000 a	USA, WVHA Green Bush ME	13720eu				2000-2100	Zimbabwe, ZBC/Radio 3	3306do	3396do	4828do	
1900-2000 th	USA, WVHA Green Bush ME	15745af				2005-2100	Syria, Radio Damascus	12085eu			
1900-2000	USA, WWCR Nashville TN	12160am	13845am	15685am		2015-2100 f/vl	Italy, IRRS Milan	7125va			
1900-2000	USA, WYFR Okeechobee FL	21745eu				2015-2045 s	Swaziland, Trans World R	3200af			
1900-1930	Vietnam, Voice of	9840eu	12020eu	15010eu		2025-2045	Italy, RAI Rome	7235me	9710me	11800me	
1900-2000	Zambia, Christian Voice	4965af				2030-2100	Egypt, Radio Cairo	7535af			
1900-2000	Zimbabwe, ZBC/Radio 4	3306do	3396do	4828do		2030-2100 mt	Estonia, Estonian Radio	5925eu			
1930-2000	Austria, R Austria Intl	5945eu	6155eu			2030-2100 as	Latvia, Radio	5935eu			
1930-2000 mtwhfa	Austria, R Austria Intl	9665me	13730af			2030-2100 asmtwh	Moldova, R Dnestr Intl	9620eu	11750eu	15290eu	
1930-2000	Iran, VOIRI Tehran	7260af	9022eu			2030-2100	Netherlands, Radio	9860af	9895af		
1930-2000	Moldova, R Moldova Intl	11580eu				2030-2050	Sweden, Radio	6065eu	9655af		
1930-2000	Mongolia, R Ulan Bator	7530as	13670eu	17900eu		2030-2100 mtwhf	Thailand, Radio	9555eu			
1930-2000	Netherlands, Radio	6020af	9605af	9860af	9895af	2030-2100	USA, WRMI/R Miami Intl	9955am			
		11655af	15315af	17605af		2030-2100	Vietnam, Voice of	12020eu	12025as	15010eu	
		6095eu	6135eu	7285eu		2045-2100	India, All India Radio	7412eu	9910au	9950eu	11620eu
1930-2000 a	Uganda, Radio	4976do	5026do					11715pa	15225pa		
1935-1955	Italy, RAI Rome	7275eu	9575eu	11905eu				15115pa			
1945-2000 t	Belarus, Radio Minsk	5940eu	7105eu	7210eu	7405eu						
1950-2000	Vatican State, Vatican R	4010eu	5882eu								

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2100-2200	Australia, Radio	6060pa 9580pa 11880pa	6080pa 9660pa 11955pa	7240pa 11660pa	7260as 11855as
2100-2130 vl	Australia, VL8A Alice Spg	2310do			
2100-2130 vl	Australia, VL8K Katherine	2485do			
2100-2130 vl	Australia, VL8T Tent Crk	2325do			
2100-2115	Bahrain, Radio	6010do			
2100-2125	Belgium, R Vlaanderen Int	5910eu			
2100-2200	Bulgaria, Radio	9700eu	11720eu		
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	5995eu 13670eu	7235eu 15150eu	11690eu 15325eu	13650eu 17820eu
2100-2200	China, China Radio Intl	6950eu	9920eu		
2100-2130	China, China Radio Intl	11715af	15110af		
2100-2200	Costa Rica, R Peace Intl	7385am	9400am	15050am	
2100-2110	Croatia, Croatian Radio	5895eu	7370eu	13830eu	
2100-2200	Cuba, Radio Havana Cuba	11705eu			
2100-2200	Egypt, Radio Cairo	15375af			
2100-2200	Eq Guinea, Radio Africa	15186af			
2100-2150	Germany, Deutsche Welle	7115as 11765af	9670as 11785as	9735af 15135af	9765as
2100-2200	Guatemala, AWR	5980am			
2100-2130	Hungary, Radio Budapest	3955eu	5935eu	7250eu	9835eu
2100-2200	India, All India Radio	7412eu 11715au	9910eu 15225au	9950eu	11620au
2100-2200 f/vl	Italy, IRRS Milan	7125va			
2100-2200	Japan, NHK/Radio	6035eu 11865as	7140eu	9580af	11850as
2100-2115	Japan, NHK/Radio	9660as	11915as		
2100-2200 mtwhfa	Liberia, Radio ELWA	4760do			
2100-2125	Netherlands, Radio	9860af	9895af	11655af	
2100-2200	New Zealand, R NZ Intl	15115pa			
2100-2200	Nigeria, FRCN/Radio	3326do	4990do		
2100-2200	Palau, KHBN/Voice of Hope	9830as	9965as		
2100-2200 vl	Papua New Guinea, NBC	4890do	9675do		
2100-2200	Romania, R Romania Intl	7195eu	9690eu	9750eu	11940eu
2100-2200	Russia, Voice of	7350eu 9880eu 11750as	9530af 11630eu 11890as	9755as 11680eu 11980eu	9820eu 11730na 13615as
2100-2115	Sierra Leone, SLBS	3316do			
2100-2200	Slovakia, AWR	6055eu			
2100-2200 vl	Solomon Islands, SIBC	5020do	9545do		
2100-2200	South Korea, R Korea Intl	6480eu	15575eu		
2100-2200	Spain, R Exterior Espana	6125eu			
2100-2200	Syria, Radio Damascus	12085eu	15095na		
2100-2110	Uganda, Radio	4976do	5026do		
2100-2200	Ukraine, R Ukraine Intl	4820eu 7240eu 11780eu	5940eu 7320eu 11950eu	6020eu 7405eu	7205eu 9750eu
2100-2200	United Kingdom, BBC London	3255af 5990as 6195eu 11750sa 15070eu	3915af 6005af 7325eu 11955as 15400eu	3955eu 6160as 9410eu 12095eu	5975na 6180eu 9740as 13660af
2100-2200	USA, KAIJ Dallas TX	13815am			
2100-2200	USA, KTBN Salt Lk City UT	15590am			
2100-2200 s	USA, KVQH Los Angeles CA	17775am			
2100-2200	USA, KWHR Naalehu HI	15405as			
2100-2200	USA, Monitor Radio Intl	13770na	13840pa		
2100-2200	USA, VOA Washington DC	6040eu 9535af 15185pa 15580af	6160eu 9760eu 15205me 17725af	7375af 11870pa 15410af 17735pa	7415af 13710af 15445af 19379me
2100-2200	USA, WEWN Birmingham AL	7425na	13615na	13760am	
2100-2200	USA, WHRI Noblesville IN	9495am	13760am		
2100-2200	USA, WINB Red Lion PA	15715eu			
2100-2200	USA, WJCR Upton KY	7490na	13595na		
2100-2200	USA, WMLK Bethel PA	9465eu			
2100-2130 a	USA, WRMI/R Miami Intl	9955am			
2100-2200	USA, WRNO New Orleans LA	15420am			
2100-2200 a	USA, WVHA Green Bush ME	13740eu			
2100-2200	USA, WWCR Nashville TN	9475am	12160eu	13845am	
2100-2200	USA, WYFR Okeechobee FL	17845af	21515af		
2100-2145	USA, WYFR Okeechobee FL	21745eu			
2100-2110	Vatican State, Vatican R	5882eu			
2100-2130	Yugoslavia, Radio	6100na	6185eu		
2100-2200	Zimbabwe, ZBC/Radio 3	3306do	3396do	4828do	
2115-2200	Egypt, Radio Cairo	9900eu			
2115-2130	United Kingdom, BBC London	6110am	15390am	17715am	
2130-2200	Australia, Radio	9610as	9645as	15365pa	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	Finland, YLE/Radio	6120eu	9730eu	11755af	15400af
2130-2200	Iran, VOIRI Tehran	9670au			
2130-2200	Liberia, Radio ELWA	4760do			
2130-2200	Lithuania, Radio Vilnius	9710eu			
2130-2200	Sweden, Radio	6065eu			

2200 UTC					
2200-2300	Australia, Radio	9580pa 11660pa 11955pa 17860pa	9610as 11695pa 13755as	9645as 11855as 15365pa	9660pa 11880pa 17795pa
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 vl	Canada, CBC N Quebec Svc	9625do			
2200-2300	Canada, CFCX Montreal	6005do			
2200-2300	Canada, CFRX Toronto	6070do			
2200-2300	Canada, CFVP Calgary	6030do			
2200-2300	Canada, CHNX Halifax	6130do			
2200-2300	Canada, CKZN St John's	6160do			
2200-2300	Canada, CKZU Vancouver	6160do			
2200-2230	Canada, RCI Montreal	5960am 13670am	9755am 13740am	11705as 15305am	11895am
2200-2230	China, China Radio Intl	3985eu			
2200-2300	Costa Rica, R Peace Intl	7385am	9400am	15050am	
2200-2210	Croatia, Croatian Radio	5895eu	7370eu	13830eu	
2200-2300	Cuba, Radio Havana Cuba	6180na			
2200-2245	Egypt, Radio Cairo	9900eu			
2200-2300	Eq Guinea, Radio Africa	15186af			
2200-2300	Guatemala, AWR	5980am			
2200-2230	India, All India Radio	7412eu 11715au	9910eu 15225au	9950eu	11620au
2200-2230	Iran, VOIRI Tehran	9670au			
2200-2300 f/vl	Italy, IRRS Milan	7215va			
2200-2215 as/vl	Italy, IRRS Milan	7215va			
2200-2225	Italy, RAI Rome	9710as	11800as	15330as	
2200-2300	Malaysia, Radio	7295do			
2200-2300	Malaysia, RTM/Kota Kinab	5980do			
2200-2300	New Zealand, R NZ Intl	15115pa			
2200-2205	Nigeria, FRCN/Radio	3326do	4990do		
2200-2300	Palau, KHBN/Voice of Hope	9965as	15140as		
2200-2300 vl	Papua New Guinea, NBC	4890do	9675do		
2200-2300	Russia, Voice of	9530af 3316do	9720af	11730na	11750as
2200-2215	Sierra Leone, SLBS	3316do			
2200-2300	Slovakia, AWR	11610am			
2200-2235 vl	Solomon Islands, SIBC	5020do	9545do		
2200-2230	South Korea, R Korea Intl	5965eu			
2200-2300	Spain, R Exterior Espana	9675af			
2200-2205	Syria, Radio Damascus	12085na	15095na		
2200-2300	Taiwan, VO Free China	5810eu	9850eu		
2200-2300	Turkey, Voice of	7185me	9445na	11710eu	
2200-2300	UAE, Radio Abu Dhabi	11885na	11970na	13605na	
2200-2300	United Kingdom, BBC London	3955eu 7325na 11695as 12095eu	5975na 9410eu 11750sa 15400eu	5975na 9590na 11835am 15400eu	7110as 9915sa 11955as
2200-2215	United Kingdom, BBC London	6180eu	9410me	15725am	
2200-2300	USA, KAIJ Dallas TX	13815am			
2200-2300	USA, KTBN Salt Lk City UT	15590am			
2200-2300	USA, KWHR Naalehu HI	17510as			
2200-2300	USA, Monitor Radio Intl	13625eu	13770am	15405as	17555sa
2200-2300	USA, VOA Washington DC	7215as 12080af 15305as	9705as 13710af 17735as	9770as 15185au 17820as	11760as 15290as
2200-2230 mtwhf	USA, VOA Washington DC	7340af	7375af	7415af	
2200-2300	USA, WEWN Birmingham AL	7425na	11820eu	13615na	15375eu
2200-2300	USA, WHRI Noblesville IN	13760am			
2200-2300	USA, WINB Red Lion PA	15715eu			
2200-2300	USA, WJCR Upton KY	7490na	13595na		
2200-2300 as	USA, WRMI/R Miami Intl	9955am			
2200-2300	USA, WRNO New Orleans LA	15420am			
2200-2300	USA, WVHA Green Bush ME	9852eu			
2200-2300	USA, WWCR Nashville TN	9475am	12160am	13845am	
2200-2245	USA, WYFR Okeechobee FL	17845af	21525af		
2230-2300	Finland, YLE/Radio	5990na	9650na	9665na	
2240-2250	Greece, Voice of	6260au	9375au		
2245-2300	Ghana, Ghana Broadc Corp	3366do	4915do		
2245-2300	India, All India Radio	9705as 15145as	9950as	11745as	13750as
2245-2300 mtwhf	USA, Voice of the OAS	9670na	11835na	15155na	
2245-2300	Vatican State, Vatican R	6150as	7305as	9600au	11830pa

FREQUENCIES

2300-2315	Armenia, Voice of	7480eu	9480eu			2300-0000 vl	Papua New Guinea, NBC	4890do	9675do		
2300-0000	Australia, Radio	9610as	9660pa	11660pa	11695as	2300-0000	Russia, Voice of	7300na	9530na	9720af	11730na
		11855as	13755as	15365pa	17795pa			11750as			
		17860pa				2300-2317	Sierra Leone, SLBS	3316do			
2300-0000 vl	Australia, VL8A Alice Spg	4835do				2300-0000	Singapore, R Singapore Int	9530as			
2300-0000 vl	Australia, VL8K Katherine	5025do				2300-0000	UAE, Radio Abu Dhabi	11885na	11970na	13605na	
2300-0000 vl	Australia, VL8T Tent Crk	4910do				2300-0000	United Kingdom, BBC London	5975na	6175na	6195as	7110as
2300-0000	Bulgaria, Radio	9700na	11720na					7180as	7325na	9580as	9590na
2300-0000 vl	Canada, CBC N Quebec Svc	9625do						9915sa	11750sa	11945as	11955as
2300-0000	Canada, CFCX Montreal	6005do				2300-2315	United Kingdom, BBC London	15340as			
2300-0000	Canada, CFRX Toronto	6070do				2300-2330	USA, KAIJ Dallas TX	13815am	15725am		
2300-0000	Canada, CFVP Calgary	6030do				2300-0000	USA, KTBN Salt Lk City UT	15590am			
2300-0000	Canada, CHNX Halifax	6130do				2300-0000	USA, KWHR Naalehu HI	17510as			
2300-0000	Canada, CKZN St John's	6160do				2300-0000	USA, Monitor Radio Intl	13625pa	13770eu	15405am	17555a
2300-0000	Canada, CKZU Vancouver	6160do				2300-0000	USA, VOA Washington DC	7215as	9705as	9770as	9890as
2300-0000	Canada, RCI Montreal	5960am	9755am	11940am	13670am			11760as	15185au	15290as	15305as
		15305am				2300-0000	USA, WEWN Birmingham AL	17735as	17820as		
2300-0000	Costa Rica, AWR Alajuela	5030am	7375am	9725am	13750am	2300-0000	USA, WHRI Noblesville IN	7425na	13615na	15375eu	
2300-0000	Costa Rica, R Peace Intl	6200am	9400am	15050am		2300-0000	USA, WINB Red Lion PA	15715eu			
2300-2310	Croatia, Croatian Radio	5895eu	7370eu	13830eu		2300-0000	USA, WJCR Upton KY	7490na	13595na		
2300-0000	Egypt, Radio Cairo	9900na				2300-0000 as	USA, WRMI/R Miami Intl	9955am			
2300-0000	Germany, Deutsche Welle	7235as	9690as	11705as		2300-2330 mtwhf	USA, WRMI/R Miami Intl	9955am			
2300-0000	Guam, AWR/KSDA	11980as				2300-0000	USA, WRNO New Orleans LA	7355am			
2300-0000	Guatemala, AWR	5980am				2300-0000	USA, WVHA Green Bush ME	9852eu			
2300-0000	India, All India Radio	9705as	9950as	11745as	13750as	2300-0000	USA, WWCR Nashville TN	5065am	9475am	13845am	
		15145as				2325-2336	Lebanon, Voice of	6550eu			
2300-0000 f/vl	Italy, IRRS Milan	7125va				2330-2345	Armenia, Voice of	9685na	11920na	11970na	
2300-0000	Japan, NHK/Radio	5965eu	6155eu	7140eu	9580as	2330-0000	Australia, Radio	9645as	9850as	13605as	15240pa
		11850as				2330-2355	Belgium, R Vlaanderen Int	6030na	13800na		
2300-2330 sm	Lithuania, Radio Vilnius	9530na				2330-0000	Netherlands, Radio	6020na	6165na	9845na	
2300-0000	Malaysia, Radio	7295do				2330-0000	Vietnam, Voice of	9840eu	12020eu	15010eu	
2300-0000	Malaysia, RTM/Kota Kinab	5980do				2335-2345	Greece, Voice of	9375sa	11595sa	11645sa	
2300-0000	New Zealand, R NZ Intl	15115pa									
2300-2305	Nigeria, FRCN/Radio	3326do	4990do								
2300-2350	North Korea, R Pyongyang	11700na	13650na								
2300-0000	Palau, KHBN/Voice of Hope	9965as	15140as								

SELECTED PROGRAMS

Sundays

- 2310 BBC (am): East Asia Today. News, analysis, press reviews and reports from BBC correspondents.
- 2310 Radio Japan: Let's Learn Japanese. See S 0310.
- 2310 Voice of America (as): VOA Today. Up-to-the-minute news summaries, hourly business and sports updates, interviews on world news events, plus features on topics from movies to medicine.
- 2325 Radio Japan: Media Roundup. See S 0525.
- 2330 BBC (am): Short Story. See S 0430.
- 2330 BBC (as pac): Letter from America. See S 0030.
- 2345 BBC (am): Write On. See S 0145.
- 2350 Radio Japan: Viewpoint. See S 0550.
- 2355 Radio Japan: Tokyo Pop-In. See S 0155.

Mondays

- 2310 BBC (am): East Asia Today. See S 2310.
- 2310 BBC (eu): Take Five. See M 0410.
- 2310 Voice of America (as): VOA Today. See S 2310.
- 2315 Radio Japan: Today's Top News Asia. See M 1515.
- 2325 Radio Japan: Profile. See M 1525.
- 2330 BBC (am): Outlook. See M 1405.
- 2330 BBC (as pac): The World Today. See M 1645.
- 2355 Radio Japan: Tokyo Pop-In. See S 0155.

Tuesdays

- 2310 BBC (am): East Asia Today. See S 2310.
- 2310 BBC (eu): An A-Z of Composers. Life-stories of some of the lesser known composers.
- 2310 Voice of America (as): VOA Today. See S 2310.
- 2315 Radio Japan: Today's Top News Asia. See M 1515.
- 2325 Radio Japan: Enjoy Japanese. See T 1525.
- 2330 BBC (am): Outlook. See M 1405.

- 2330 BBC (as pac): The World Today. See M 1645.
- 2355 Radio Japan: Tokyo Pop-In. See S 0155.

Wednesdays

- 2310 BBC (af): Topical Reports. A five-minute current affairs program.
- 2310 BBC (am): East Asia Today. See S 2310.
- 2310 Voice of America (as): VOA Today. See S 2310.
- 2315 Radio Japan: Today's Top News Asia. See M 1515.
- 2325 Radio Japan: History and Classics. See W 1525.
- 2330 BBC (am): Outlook. See M 1405.
- 2330 BBC (as pac): The World Today. See M 1645.
- 2355 Radio Japan: Tokyo Pop-In. See S 0155.

Thursdays

- 2310 BBC (am): East Asia Today. See S 2310.
- 2310 BBC (eu): Take Five. See M 0410.
- 2310 Voice of America (as): VOA Today. See S 2310.
- 2315 Radio Japan: Today's Top News Asia. See M 1515.
- 2325 Radio Japan: Enjoy Japanese. See T 1525.
- 2330 BBC (am): Outlook. See M 1405.
- 2330 BBC (as pac): The World Today. See M 1645.
- 2355 Radio Japan: Tokyo Pop-In. See S 0155.

Fridays

- 2310 BBC (af): Science Five. See W 0410.
- 2310 BBC (am): East Asia Today. See S 2310.
- 2310 BBC (eu): Science Five. See W 0410.
- 2310 Voice of America (as): VOA Saturday. See S 0010.
- 2315 Radio Japan: Today's Top News Asia. See M 1515.
- 2325 Radio Japan: Music and Book Beat. See F 1525.
- 2330 BBC (am): Outlook. See M 1405.
- 2330 BBC (as pac): The World Today. See M 1645.
- 2355 Radio Japan: Tokyo Pop-In. See S 0155.

Saturdays

- 2310 BBC (af): Spotlight. See S 0410.
- 2310 BBC (eu): Spotlight. See S 0410.
- 2310 Radio Japan: Asia Weekly. See S 0110.
- 2310 Voice of America (as): VOA Sunday. See S 0010.
- 2311 Radio Japan: Asian News Summary. See S 0111.
- 2321 Radio Japan: Business Report. See S 0121.
- 2325 Radio Japan: Entertaining in Asia. See S 0125.
- 2330 BBC (am): The John Dunn Show. See S 0330.
- 2340 BBC (as pac): Book Choice. See S 1525.
- 2346 Radio Japan: Asia Kaleidoscope. See S 0146.
- 2355 Radio Japan: Tokyo Pop-In. See S 0155.

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UACC164	SCAN-STARR COMMERCIAL	\$109.95
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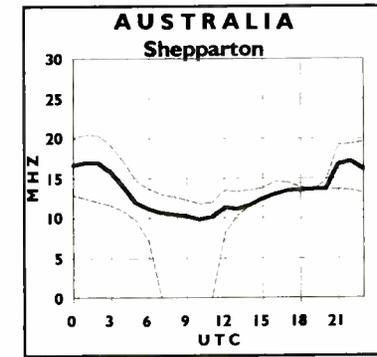
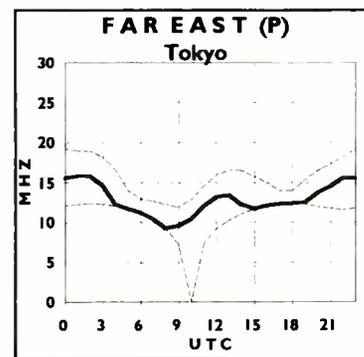
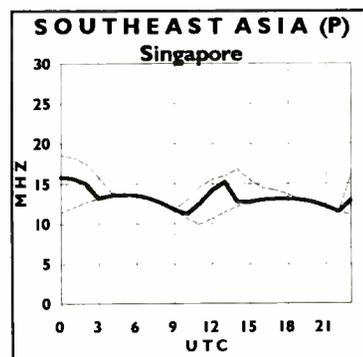
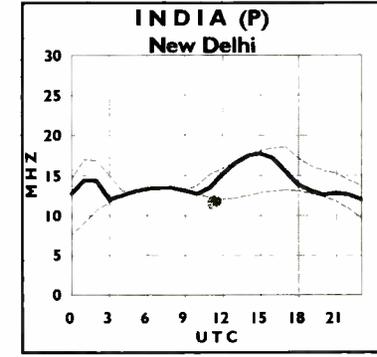
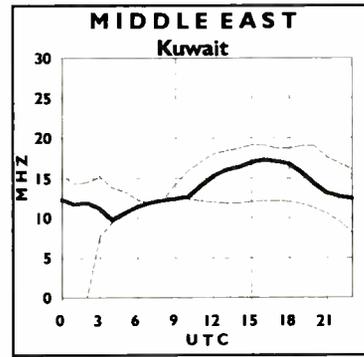
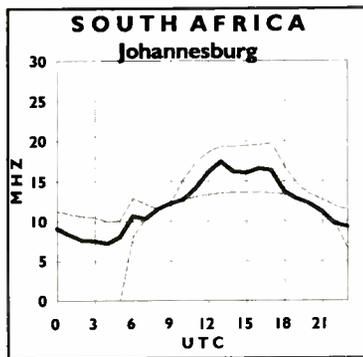
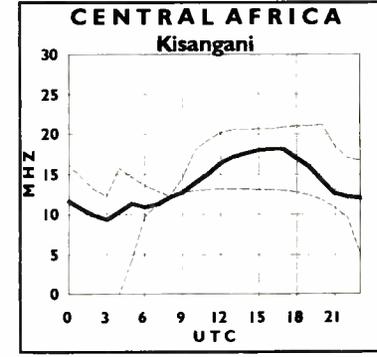
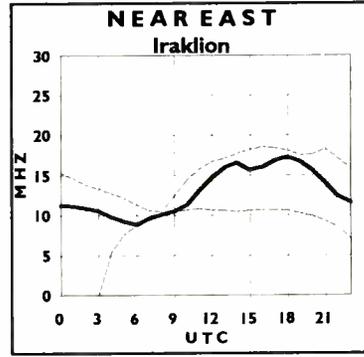
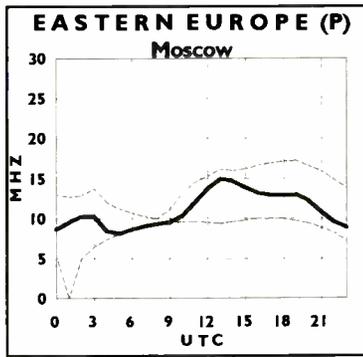
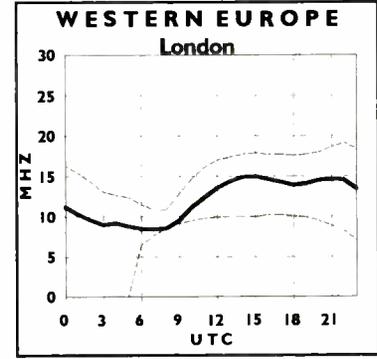
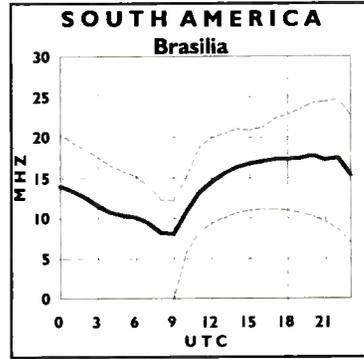
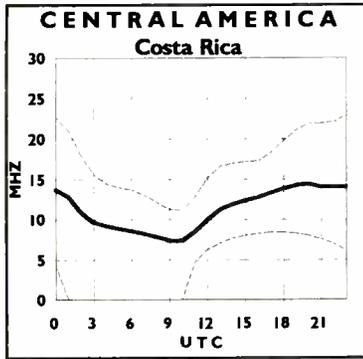
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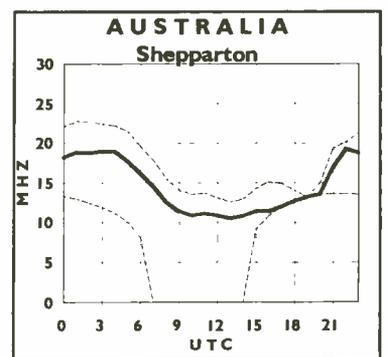
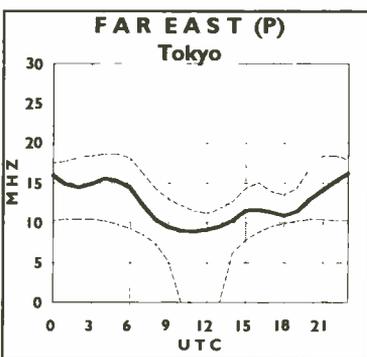
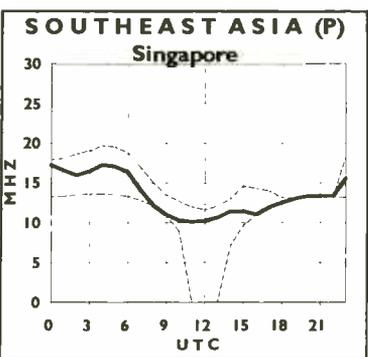
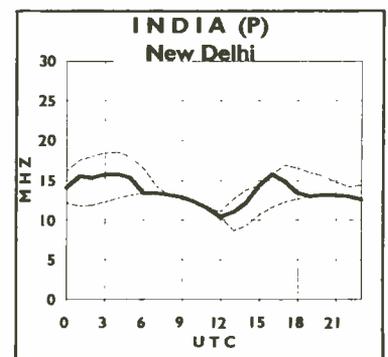
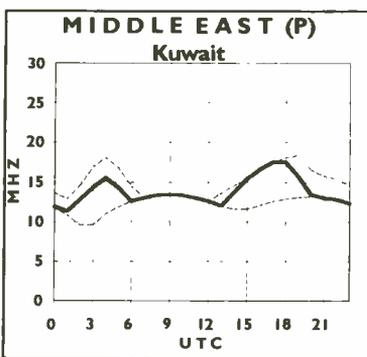
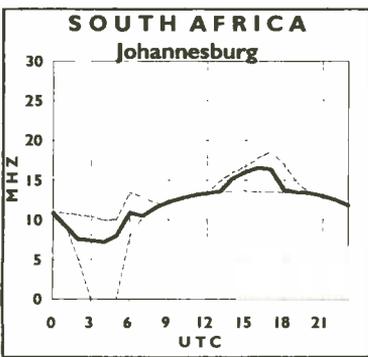
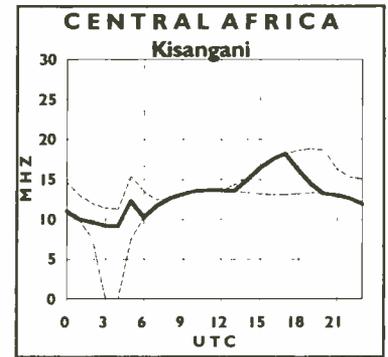
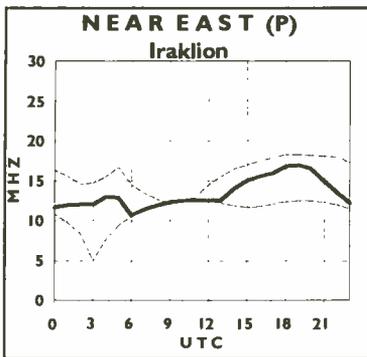
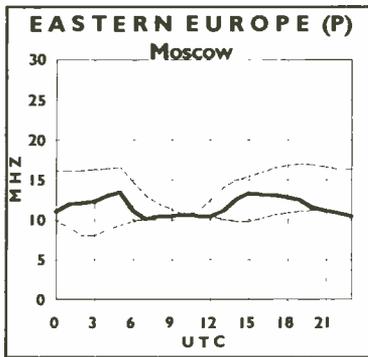
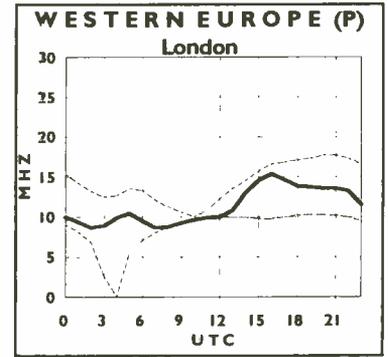
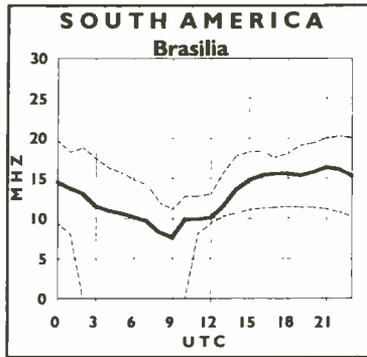
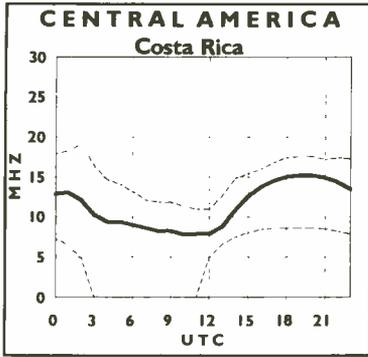
Propagation Conditions: Eastern United States

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. The Sun Spot Number used this month for forecasting purposes is 11.



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.



Worldwide Ute News—An Electronic Club

Welcome to Digital Digest. This month we feature the new electronic utility club on the Internet—The Worldwide Ute News Club that rose like the proverbial phoenix from the ashes of SPEEDX.

When SPEEDX ceased publication earlier this year, several of the members put a great deal of effort into molding a replacement that would guarantee a continuing source of utility information, QSLs, and logs. After discussions with many fans via e-mail (many were non-SPEEDX members, or were members of other SWL clubs worldwide). The WORLDWIDE UTILITY NEWS Club...or WUN (pronounced like #1), was born.

WUN is unique in that it is the first dedicated "utility station" club and the first electronic club with an electronic newsletter. "Members" join by simply sending e-mail to the WUN listserver at:

Majordomo@phoque.info.uqam.ca
with the following command in the BODY of your e-mail message:

subscribe wun

There are no dues for this club, and a monthly



Comforce

Embassies, ships, planes, spies, search and rescue, military operations . . . these voice and digital communications represent an irresistible challenge for shortwave utility listeners.



R. Bought



US Air Force

Current columns cover the following topics:

- International Civil Aero
- Maritime
- Military
- Other SSB News and Unidentified's (non-aero, non-maritime, non-military)
- Digital News & Info
- Logs
- New products, and reviews
- QSL's-received and info
- Numbers/Oddities

Those without computer/Internet access are also welcome. A paper copy of the latest *WUN Club Newsletter* may be obtained by mailing \$1.50 US to Tim Braun, 15915 Smithey Drive, Haymarket, VA., 22069 USA.

A World Wide Web (WWW) server is now available on the Internet for information and news about the Worldwide Utility News Club. To access the WWW server, use your favorite web browser and access the URL:

<http://sun-gabriel.aero.org:8800/>
This will put you in the WUN home page. Note that there is no anonymous ftp access to this server!

Hot News from Cayenne — (the City, not the Pepper!)

We introduced French military transmissions in a previous column (July 94), but you may find a more detailed example of message traffic to be helpful. The following is an ARQ-E3 96/400 transmission on 10281.2 kHz from French Forces (RFLIGC) in Cayenne, French Guiana, South America. Given the message content it certainly qualifies as a "Limited Broadcast," or as we would express it in English, "Local News." Where possible, I have included the translation or decipherment.

VZCZC RTI767	ZCZC - Start of transmission signal. Circuit "RTI" Cayenne to Fort de France. Message #767 on this circuit.
PP RFFAAX	Forward to Paris
DE RFLIGC 0003 1342100	From Cayenne, Msg # 3, 134th day of year, time 2100Z
ZNR UUUUU	Security: Unclassified
P 142100Z MAI 95	14th May/95 Time 2100Z
FM GROUPEGEND CAYENNE	From: Group Gendarmerie (police) Cayenne
TO RFFAAX/GENDARMERIE PARIS	To: Gendarmerie (police) Paris
RFFAAX/INSPEGEND PARIS	Police Inspector (Paris)
RFFAAX/COMGENDOM ARCCIL	Commander (Police) ARCCIL (Paris)
ZEN/LEGEND FORT DE FRANCE	ZEN (Drop copy of message to unit having same routing indicator as originator)
INFO RFLIF/GROUPEGEND FORT DE FRANCE	Police Group (garrison) Fort de France (Martinique)
RFLIDA/GROUPEGEND ST CLAUDE	Police Group (Garrison) St. Claude (Guadeloupe)
BT	BT - Signal to mark the separation between different parts of the same transmission
D I F F U S I O N R E S T R E I N T E	
Limited broadcast	
NMR/ 458/2.GED.GY.RENS DU 14 MAI 1995	
OBJ: "M.R.Q. GUYANE"	
III - ORDRE PUBLIC	Public Notice

36 - IMMIGRATION

A LE 13 MAI 1994 A ST LAURENT DU MARONI : 12 RESSORTISSANTS SURINAMAIS EN SITUATION IRREGULIERE ONT ETE INTERPELLES AU COURS D'UNE OPERATION DE POLICE ADMINISTRATIVE. ILS ONT ETE RECONDUITS DANS LEUR PAYSVM A E PIROGUES ET 3 MOTEURS ONT EGALEMENT ETE SAISIS. PAGE DEUX RFLIGC 0003 DIFFUSION RESTREINE
VII - DIVERS

*On May 13, 1995, at St Laurent du Maroni 12 Surinam nationals in an unauthorized expedition were intercepted during a police operation - They have been driven (sent) back to their country - A canoe and three motors were also seized.
Page Two RFLIGC 0003 Limited Broadcast*

A LE 14 MAI LQOOR A ROURA, AU COURS D'UNE FAUSSEL MANOEUVRE, UN BULDOZER S'EST RETOURNE, ECRASANT SON CONDUCTEUR. DANS UN TERRAIN DIFFICILE, LES SECOURS S'ACTIVENT ACTUELLEMENT POUR DEGAGER LE CORPS AVEC LE CONCOURS DES MOYENS DE LEVAGE DE L'ARMEE. - LA VICTIME, QUI N'A PAS ENCORE ETE FORMELLEMENT IDENTIFIEE, SERAIT UN RESSORTISSANT BRESILIEN AGE D'UNE QUARANTAINE D'ANNEES.

On the 14th of May at (LQOOR A ROURA) during an unauthorized expedition, a bulldozer flipped, crushing its driver. In rough terrain, aid personnel are trying to dig out the body with the help of the Army Engineer Corps - The victim who has not been formally identified, appears to be a Brazilian national in his forties.

BT	BT - Signal to mark the separation between different parts of the same transmission
0003	Message # 3
NNNN	NNN End of transmission signal

International DX — on AM?

Most people think of the domestic AM/FM/TV bands as being good only for local reception. Even DXers usually think of the domestic broadcast bands in terms of North American reception. While most DXers do have a handful of powerful Cuban and Mexican stations in their logs, the vast majority of their loggings are from the U.S. and Canada.

Several readers have expressed surprise (*awe* may be a better word) over Mark Connelly's impressive international loggings, reported from time to time in "Skipping In."

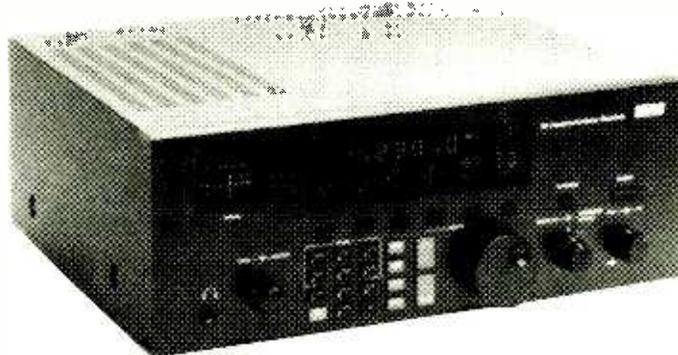
(see Connelly's feature in this issue ed.) Admittedly, Mark has an unusually good location, a good receiver, and room for bigger antennas than most of us can hope for. But with persistence and some knowledge of what's out there, you, too, can put some exotic foreign stations in your log.

International DXing adds two challenges to those already present for the domestic DXer. First, the challenge of separating the overseas targets from the domestic interference. Especially for those who live some distance from the coasts, you'll be fighting the signals of closer-in U.S. and Canadian stations. The second challenge is that of identifying your DX. Most other countries don't require their stations to use call letters, so you aren't going to get a nice, clean, "This is VKDX Brisbane" ID.

■ Equipment and antennas

Separating the foreign DX from the domestic signals puts a premium on selectivity. A portable receiver will land you some of the more common Caribbean stations. But a good communications receiver like the Drake R8, with its narrow filters, will be necessary to pull in the more exotic overseas DX.

As for antennas, again a simple loop will suffice for closer-in Caribbean DX. If you have the room for something bigger, remember the first rule of antennas—if it stays up through the winter, it isn't big enough! Seriously, put up the longest wire you can, keeping it as far from power lines and other noise sources as possible. Height above ground isn't that important. (I've had considerable



The Drake R8, recently replaced by the R8A, is a great receiver to pick up International AM broadcasts.

success with a 400' wire lying on the ground.)

■ When to listen

As I mentioned in April, it's possible to DX domestic stations at almost any time of day. Unless you live in Florida (where Cuban and Bahaman stations come in all day long) you'll hear foreign stations only at night.

Within the Americas, if it's night where you are, it's also night (or close enough to it) elsewhere on the continent. Inter-American DX should be possible all night long.

If you're lucky enough to have a coastal location, trans-Atlantic (or trans-Pacific) DX may be possible. Remember the time difference. It may still be dark at your location at 4am EDT (0800 UTC), but that's 10am in Germany. With the sun well above the horizon, German AM signals will be fading fast, if they're audible at all.

■ How do I identify my DX?

At least in theory, it's relatively easy to identify a U.S. domestic station: they're required to give their call letters and city every hour on the hour. But the U.S. is virtually the only country that has this regulation—most other countries don't even assign call letters to their stations. So how do you determine what you're hearing?

When DXing international stations, look for a station name or slogan. Even if the station isn't broadcasting in English, you're likely to recognize station names. Names of cities and political leaders, mentioned in news-casts, will also help identify your DX.

Except in Cuba, most Latin American stations carry plenty of commercials. Local commercials are just as useful in identifying these stations (even if you don't speak Spanish) as they are in IDing your domestic DX.

■ How about a QSL?

Be sure to write your report in the language in which the station was broadcasting. Short-wave stations which target English-speaking audiences expect to receive reports in English, and

most have staff members able to reply to such reports. This isn't the case with regular AM stations. It's quite likely such stations have no English-speaking employees, and will have no idea what to do with your report.

When reporting to a smaller private station, especially in the Caribbean or Latin America, include an IRC. Many of these stations aren't any better off financially than smaller U.S. AM stations; there may literally be no money for postage for replying to QSL requests.

■ What about FM & TV?

DXers within about 1500 miles of the border stand a fair chance of eventually logging Cuban and Mexican FM & TV stations by sporadic-E (see *May American Bandscan*).

TABLE 1

Overseas Stations Frequently Heard by U.S. DXers:

532 kHz	R. Vision Cristiana, Turks & Caicos, British West Indies
540 kHz	XEWA, Mexico
670 kHz	R. Rebelde, Cuba
770 kHz	HJXX, Bogoto, Colombia
800 kHz	R. Transmundial, Bonaire, Netherlands Antilles
810 kHz	ZNS3, Freeport, Bahamas
830 kHz	Trinity Broadcasting, St. Kitts & Nevis
891 kHz	RTA, Algeria
1020 kHz	Caribbean Christian R., Turks & Caicos
1611 kHz	Vatican Radio, Rome

Skipping In

560 kHz	WIND, Chicago
1070 kHz	WIBC, Indianapolis
1160 kHz	WJJD, Chicago
1250 kHz	WMTR, Morristown, NJ
1280 kHz	WWTC, Minneapolis
1420 kHz	WCED, DuBois, PA
1470 kHz	WVOL, Nashville

There are some good catches in this list! WVOL's transmitter is only 20 miles from my location, but it's barely audible even here at night. This month's DX is from William McGuire of Cheverly, Maryland.

There are few FM stations in Cuba, but plenty in Mexico, and they all carry plenty of ads, making them easy to identify!

FM stations in Bermuda (94.9 and 106.2 MHz) and the Bahamas (100.3 and 104.5 MHz) have also been heard widely in the eastern USA, both via sporadic-E and tropospheric propagation.

International DX Test

Here's hoping some of you logged a truly exotic DX test on the evening of Friday, May 12, between 2-2:30am EDT. The AM affiliate of popular shortwave station HCJB Quito, Ecuador, aired a special program for DXers. The test was to include distinctive music and plenty of Morse Code IDs.

If you were lucky enough to hear HCJB on 690 kHz AM, send your report, with an IRC for return postage, to:

690 DX Test
c/o Frequency Management
HCJB
Casilla 17-17-691
Quito, Ecuador

Bits and Pieces

• Karl Slavetsky of Charlotte, NC, asks what receiver and antenna Mark Connelly uses for his European catches. Mark uses a Drake R8 and two 120-foot sloping wires. Mark's coastal location (about 15 miles northwest of Boston) certainly doesn't hurt!

• Susan Barna in Massachusetts has an addition for my list of DX references (March 1995 *American Bandscan*). She keeps the sports page of her local newspaper next to the receiver. Susan says, "If I come across a station broadcasting a sporting event, I listen for a team or city name, look in the sports page to find the team they are playing against that day, then check a reference source to see which city has a station at that frequency." An

excellent idea, especially now that baseball season is in full swing.

• Did you hear KUSA? The special demonstration digital radio station in Las Vegas, reported in my June column, was widely heard throughout the eastern USA. Donald Tomkinson near Los Angeles and Grant Manning in Smithville, Tennessee, both wrote to report hearing this station on 1660 kHz. I also heard it here near Nashville, with an excellent signal.

• Speaking of Las Vegas, George Appleton sent an item from the April 12 *Las Vegas Weekly* reporting a call-letter and programming change on 1410kHz. The former KFMS, which relayed KFMS-FM 101.9's country music, is now KKDD and airs programs for pre-teen children.

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Reflections on a Tragedy

In April, the most horrible act of terrorism ever committed on United States soil was committed. The destruction of the Federal building in Oklahoma City brought the unwelcome realization that we are not safe even in our own beds.

The target of this terrorist act appeared to be the entire Federal government in general, and the Bureau of Alcohol, Tobacco, and Firearms in specific. The BATF is responsible for enforcing the laws regulating explosives, firearms, ethyl alcohol production, and tobacco products. It is a branch of the department of the Treasury.

The radio system used by the BATF is based around a sixteen channel system. The layout of the channel format is listed in Table 1.

The following frequencies are used, but where they are programmed into the radios is unknown.

- 166.5625 The simplex frequency used for the FINCIN operation. This is the "top secret" Financial Crime Intelligence Network—very hush-hush
 - 166.5000 Simplex frequency used for explosives investigations
 - 166.2875 Special operations group
 - 166.4125 Firearms production investigations
 - 165.5375 Tactical simplex
 - 166.7500 Tobacco products investigation-simplex
 - 166.8750 Alcohol products investigation-simplex
 - 170.4125 Special operations group-simplex
- The p/l tone mentioned above is 167.9 Hertz.

While a majority of the radio traffic is conducted on the VHF bands, the BATF has the capability to coordinate their operations with the users of the 406-420 MHz band. This traffic is usually done in joint operations with the Internal Revenue Service and the Drug Enforcement Administration.

The BATF has a UHF radio system that is not generally known. The radios are set up in four 12-channel formats. The last known layout is listed in Table 2.

When the BATF sets up surveillance operations, the following frequencies are generally used for electronic surveillance:

- 166.2875 170.4125 165.5125 165.2875

When this writer was involved with joint electronic surveillance operations, the frequency of 165.2875 MHz was used for their

Chan	Frequency	Use	Tone
01	165.2875	SIMPLEX	1Z
02	166.5375	BASE TO CAR	1Z
03	165.2875	RPTR OUT	1Z/ST1
	166.5375	RPTR IN	1Z/ST1
04	SAME AS CH3 ZONE 2		ST2
05	SAME AS CH3 ZONE 3		ST3
06	SAME AS CH3 ZONE 4		ST4
07	SAME AS CH3 ZONE 5		ST5
08	166.4625	SIMPLEX-Treas. com.CAR. SQ.	
9	165.9125	SIMPLEX	1Z
10	173.8875	SIMPLEX	1Z
11	168.0000	SIMPLEX	1Z
12	173.8875	RPTR OUT	CAR. SQ.
	166.5375	RPTR IN-Portable repeater	
13	166.9250	RPTR OUT	1Z
	165.9250	RPTR IN-Portable repeater	
14	166.8500	SIMPLEX	CAR. SQ.
15	164.6500	RPTR OUT	CAR. SQ.
	168.8625	RPTR IN	
16	164.6500	SIMPLEX	CARRIER

NOTE: 164.6500 is Secret Service Tango frequency. This is a portable repeater used for joint operations.

body bugs. Yes, I know, this is the main BATF frequency. The repeaters would be turned off so that all of the agents could monitor the body transmitter.

There is one set of frequencies not normally found in the BATF UHF radios. These are the frequencies used for internal security in the BATF. They are:

- Ch.1 407.825--simplex
- Ch.2 407.850--simplex
- Ch.3 407.875--simplex

These are referred to as TAC1 thru TAC3. The main internal security frequency for the BATF is 407.150 MHz. Most radios also have the frequency of 409.150 MHz—the main channel for the Department of the Treasury Internal Affairs—in their channel allocation.

Going back to Oklahoma City, the FBI has been reported using the following frequencies in their follow-up investigation of the bombing. They are:

Chan	Frequency	Use	Tone
A1	167.4875	RPTR OUT	167.9
A2	167.2750	SIMPLEX	167.9
A3	167.4375	SIMPLEX	167.9
A4	167.5625	SIMPLEX--Nationwide common FBI	167.9
A5	163.9875	RPTR OUT	167.9
	167.4875	RPTR IN	
A6	163.8625	RPTR OUT	167.9
	167.5375	RPTR IN--SWAT portable repeater	

Other agencies involved in the Oklahoma

City disaster included the Federal Emergency Management Agency (FEMA), whose shortwave channels became active immediately following the explosion. Their main frequency of 10.493 MHz, known as FOXTROT 29, came on the air calling for assistance. The American Red Cross channels in the 47 MHz band started coming in on skip. The other most commonly used FOXTROT FEMA channels came on the air. Some of the ones heard were:

- 5.212, 7.394, 14.451, 14.837, 17.650 MHz.

Other unknown channels were heard in the 5 MHz band, and were assumed to be part of the Oklahoma Civil Defense System.

■ When FEMA Comes to Town

Should a situation occur in your town where communications are totally knocked out, such as after Hurricane Andrew down here in Florida, or when local government totally breaks down (hopefully, never), FEMA will respond with one of their mobile communications units. These are flown in by military transport due to their size.

Some of the frequencies that will be in use are listed as follows.

FEMA National Radio System VHF Network
164.8625 165.6625 MHz

FEMA National Emergency Network

Chan	Frequency	Use
01	142.3500	SIMPLEX
02	142.4250	SIMPLEX
03	142.2300	SIMPLEX
04	142.9750	RPTR OUT
	142.2300	RPTR IN
05	143.0000	RPTR OUT
	142.4250	RPTR IN
06	142.9750	SIMPLEX
07	143.0000	SIMPLEX

FEMA National Emergency Training Center
163.1000 166.2250 168.3500 169.6000 MHz

National Emergency Warning System

Chan	Frequency	Use
01	167.9750	RPTR OUT
	173.1875	RPTR--Region 1 Emerg. Ops Cntr Net
02	167.9750	SIMPLEX--Region 2 Ops Net
03	169.8750	SIMPLEX--Region 3 Ops Net
04	167.9250	SIMPLEX--Region 4 Ops Net

When the Rosemont Pavilion for the World Cup was held in Pasadena, California, back in 1994, FEMA brought in one of their mobile communications vans. This van is the size of a tractor trailer and is transported in a military cargo plane. There is not enough space to completely describe this vehicle in this month's column, but the following frequency layout was observed:

Frequency	Use	Tone
138.400	SIMPLEX	CARRIER SQUELCH
138.575	SIMPLEX	118.8 Hz
148.575	RPTR OUT	CARRIER
139.825	RPTR INPUT FOR 148.575 MHz	
	RPTR	
139.950	SIMPLEX	CARRIER SQUELCH

More on these communications vans in an upcoming article. That's it for this month. 73's John--WA4VPY

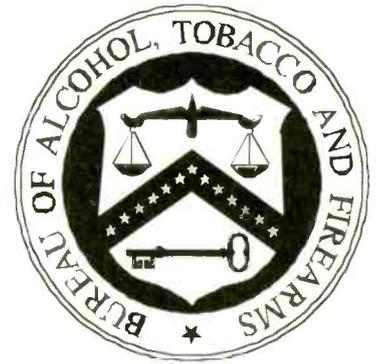


TABLE 2

UHF BATF Administration Operations

Chan	Frequency	Use	Tone
01	418.225	SIMPLEX	123.0
02	418.225	RPTR OUT	123.0
	414.700	RPTR INPUT	
03	418.175	TACT. SIMPLEX	123.0
04	418.200	TACT. SIMPLEX	123.0
05	418.225	RPTR OUT	123.0
	414.700	RPTR IN	
06	409.875	RPTR OUT	123.0
	414.700	RPTR IN	
07	416.800	RPTR OUT	123.0
	414.700	RPTR IN	
08	419.9375	RPTR OUT	123.0
	414.700	RPTR IN	

UHF BATF/FBI/DEA Joint Operations

Chan	Frequency	Use	Tone
09	418.225	SIMPLEX	123.0
10	418.225	RPTR OUT	123.0
	414.700	RPTR IN	
11	418.175	SIMPLEX	123.0
12	418.200	SIMPLEX	123.0
13	414.550	RPTR OUT	167.9
	414.700	RPTR IN-Joint FBI/BATF ops	
14	414.4500	RPTR OUT	167.9
	414.700	RPTR IN-Joint FBI/BATF ops	
15	418.625	RPTR OUT	156.7
	414.700	RPTR IN-Joint DEA/BATF ops	
16	418.750	RPTR OUT	156.7
	414.700	RPTR IN-Joint DEA/BATF ops	

UHF Drug Enforcement Radio Channels

Chan	Frequency	Use	Tone
17	418.625	RPTR OUT-DEA CH 1	156.7
	416.050	RPTR IN	
18	418.900	RPTR OUT-DEA CH 2	156.7
	416.325	RPTR IN	
19	418.750	SIMPLEX-DEA CH 3	156.7
20	418.675	SIMPLEX-DEA CH 4	156.7
21	418.825	RPTR OUT-DEA CH 5	156.7
	415.600	RPTR IN	
22	418.950	RPTR OUT-DEA CH 6	156.7
	416.200	RPTR IN	
23	418.975	RPTR OUT-DEA CH 7	156.7
	417.025	RPTR IN	
24	418.075	RPTR OUT	156.7
	418.975	RPTR IN-U.S. Government common agency channel	

BATF Interagency Pool

Chan	Frequency	Use	Tone
25	418.225	SIMPLEX	123.0
26	418.225	RPTR OUT	123.0
	414.700	RPTR IN	
27	418.175	BATF tactical simplex	123.0
28	418.200	BATF tactical simplex	123.0
29	414.550	RPTR OUT	167.9
	414.700	RPTR IN-BATF/FBI joint ops	
30	414.450	RPTR OUT	167.9
	414.700	RPTR IN-BATF/FBI joint ops	
31	418.625	RPTR OUT	156.7
	414.700	RPTR IN-BATF/DEA joint ops	
32	418.750	RPTR OUT	156.7
	414.700	RPTR IN-BAT/DEA joint ops	

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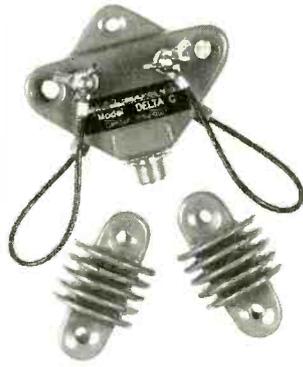



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E-mail by Radio

The world of computers is penetrating further into world shipping. Globe Wireless has come up with a new service which may bring some interesting changes to maritime radio. GlobeEmail will offer all of the conveniences of an office e-mail system aboard ship. Messages can be exchanged and data files transferred between ship and shore efficiently and at less cost than is currently done via satellite.

Current satellite communications systems charge their customers based on the time during which a circuit is connected regardless of the data throughput. Globe Wireless plans to charge its customers based on the number of kilobits delivered—in other words, by the amount of information transferred, not by how long it takes. This can be achieved through the use of real-time earth-based data links between Globe's various stations, thus saving the cost of earth stations and leasing time on a satellite transducer.

So how will this affect the world of maritime radio? If Globe Wireless is right they will bring traffic back to HF from satellites and possibly increase the amount of traffic.

Sending a message from on board a ship is easy and does not require handling the radio equipment. Users may write their message, or create a data file from a word processor or spread sheet programme of their own, or they can use the program supplied with the system. Data files will be attached to brief text messages when they are sent. Once the message has been written, all the user needs to do is press the "send" button to start the message on its way to its destination.

The software also controls the radio and monitors the various Globe frequencies. When a message is ready to be sent, the system uses one of the unoccupied frequencies to pass the message to the coast station and thence on to its destination.

The same system which monitors for unused frequencies also keeps watch for calls to the ship. When a call is received the system retrieves the message from the coast station and then sounds an alarm and puts a message on the computer screen to advise of its arrival. The system is automatic and the users need not handle the radio equipment at all to send and receive their messages.

While in the past, messages were sent by telex, or transcribed from the telephone and



GLOBE WIRELESS

sent by CW, now users of electronic mail systems such as EasyLink, BIMCOM, CompuServe, MCI Mail, and many others can send messages directly to ships using this new system. Traditional telex access will, of course, continue.

■ Globe Gambling on HF

As I have mentioned in previous columns Globe Wireless has stations in Louisiana, California, and Newfoundland, as well as Hawaii, Sweden, and New Zealand. New stations are scheduled for commission in other locations as the network is expanded in order to offer world-wide coverage. Fully automatic and manual telex SITOR is possible along with the GlobeEmail automated system.

The Telex frequencies at KFS (California) and WNU (Louisiana) are listed in Table 1.

■ United States Coast Guard makes final CW broadcast

At 0001 hours on April 1, 1995, NMN in Portsmouth, Virginia, made its final CW broadcast. Figure 1 is the text of that message as posted on the internet by Ron, W4VR, from USCG Telecomms in Washington.

Should Globe Wireless be correct, GMDSS, with its reliance on, satellites may not force HF as far into the background as we all might think.

Until September, I trust you will all enjoy your summer's monitoring and I look forward to reading your letters and loggings—the more interesting of which will, of course, be shared with your fellow readers. Until then, good listening, safe boating and have a happy summer.

FIGURE 1

CQ CQ CQ DE NMN NMN

BT

O 010001Z APR 95
FM COGARD CAMSLANT CHESAPEAKE VA/NMN
TO ALL
BT

USCG NOW CLOSING DOWN CONTINUOUS HFCW WATCH CEASING ALL MORSE CODE OPS IN THE HF BAND. AS WE CONCLUDE OUR WATCH WE WISH THE MARITIME COMMUNITY FAIR WINDS AND FOLLOWING SEAS. WE ARE PROUD OF OUR TRADITION AND LONG STANDING SERVICE TO THE MARINER ON MORSE CODE BEGINNING IN 1901 WITH THE REVENUE CUTTER SERVICE EXPERIMENTING WITH WIRELESS AS A MEANS TO COMMUNICATE ON LAND AND SEA TO THE FIRST MORSE CODE RADIO INSTALLED ABOARD CUTTER GRANT IN 1903. OUR ORIG COMMS MISSION WAS TO RCY DISTRESS ALERTS. BUT SINCE 1901 THE CG HAS FAITHFULLY AND DILIGENTLY LISTENED FOR TRAFFIC RESPONDING TO HUNDREDS OF THOUSANDS OF CALLS FM MARINERS IN NEED OF ASSIST OR RPTG POSITION WX NAV OR SAFETY INFO. OVER THE YRS WE HAVE PROVIDED MARINERS WITH URGENT SAFETY AND NAV WARNINGS OVER HFCW AND RCVD VESSEL LOCATION UPDATES FOR THE AMVER SYS. WE WILL FEEL A SENSE OF LOSS WITH THE PASSING OF CW. THE NEED FOR OPERATORS WITH SENSITIVE EARS AND A FAST PRECISE KEY WILL BE REPLACED BY COMPUTER MODEMS AND AUTO ALARMS. THE SPECIAL EMOTION AND EXCITEMENT ENJOYED BY CW OPERATORS CANNOT BE DUPLICATED AND THE CHILLING SOS SIGNAL WILL NEVER AGAIN BE RCVD BY A CG UNIT. BUT CW HAS RUN ITS COURSE AND WE NOW LOOK FWD TO SERVING YOU ON THE NEXT GENERATION OF COMM SYSTEMS VIA THE GMDSS. FM ALL CG TLECOMM SPECIALISTS WE BID YOU 73. WHAT HATH GOD WROUGHT. SIGNED CG CAMSLANT.

BT

DE NMN VA

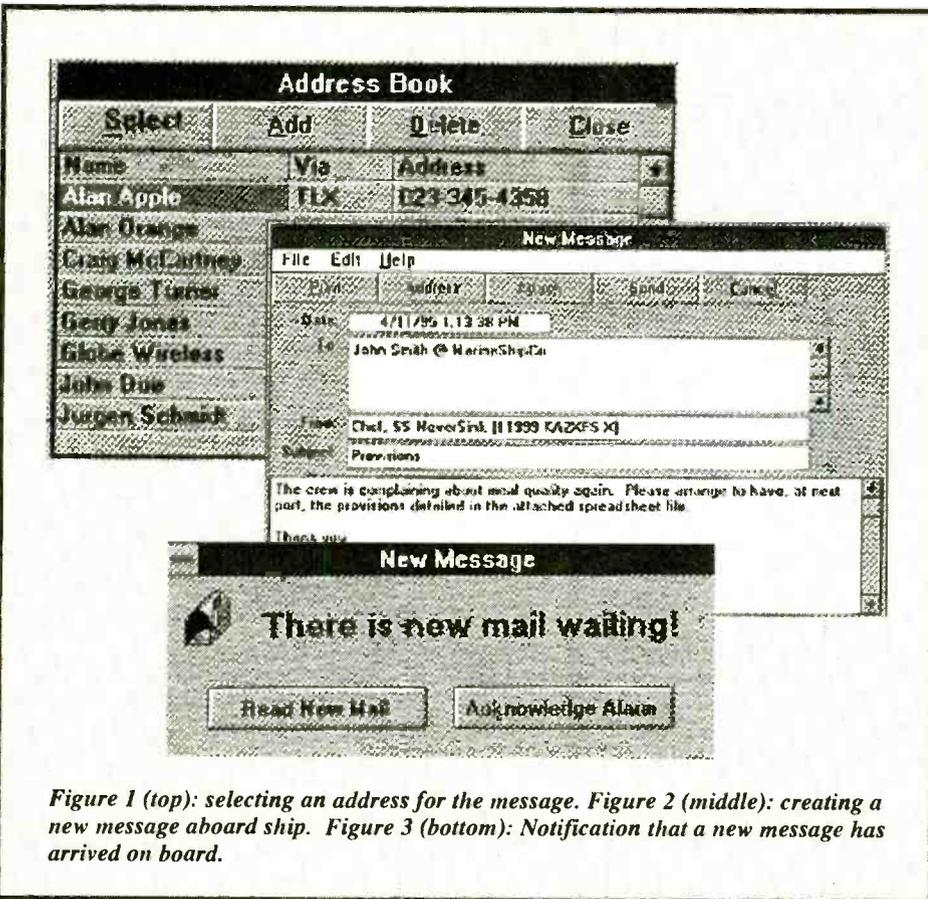


Figure 1 (top): selecting an address for the message. Figure 2 (middle): creating a new message aboard ship. Figure 3 (bottom): Notification that a new message has arrived on board.

TABLE 1

Frequency (MHz) and Station of Telex Frequencies

2.1770	KFS				
2.1770	WNU	12.5795	KFS	19.6875	KFS
4.2105	KFS	12.5800	WNU	19.7035	KFS
4.2110	WNU	12.5805	KFS	19.7035	WNU
4.2115	KFS	12.5885	WNU	19.7040	KFS
4.2195	KFS	12.5930	KFS	19.7040	WNU
4.2195	WNU	12.6025	KFS	19.7045	KFS
4.2200	KFS	12.6050	WNU	19.7045	WNU
4.2200	WNU	12.6075	WNU	22.3765	KFS
4.2205	KFS	12.6570	KFS	22.3770	WNU
4.2205	WNU	12.6570	WNU	22.3775	KFS
6.3145	KFS	12.6575	KFS	22.3855	WNU
6.3150	WNU	12.6575	WNU	22.3900	KFS
6.3155	KFS	12.6580	KFS	22.3995	KFS
6.3310	KFS	12.6580	WNU	22.4020	WNU
6.3310	WNU	16.8070	KFS	22.4045	WNU
6.3315	KFS	16.8075	WNU	22.4440	KFS
6.3315	WNU	16.8080	KFS	22.4440	WNU
6.3320	KFS	16.8160	WNU	22.4445	KFS
6.3320	WNU	16.8200	KFS	22.4445	WNU
8.4170	WNU	16.8295	KFS	22.4450	KFS
8.4175	KFS	16.8320	WNU	22.4450	WNU
8.4255	WNU	16.8345	WNU	26.1065	WNU
8.4300	KFS	16.9030	KFS	26.1075	KFS
8.4365	KFS	16.9030	WNU	26.1210	KFS
8.4365	WNU	16.9035	KFS	26.1210	WNU
8.4370	KFS	16.9035	WNU	26.1215	KFS
8.4370	WNU	16.9040	KFS	26.1215	WNU
8.4375	KFS	16.9040	WNU	26.1220	KFS
8.4375	WNU	19.6865	WNU	26.1220	WNU

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Reviewed by Larry Miller in April '93

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Peaking Your Dish

You probably thought, when you first blundered into this hobby, that once you got your dish all set up and working properly that, like your roof-top over-the-air TV antenna, it would mind its own business and happily deliver signals, worry free, for decades to come. Wrong!

Standing its lonely vigil, your dish—silent sentinel of the microwaves—begins its maintenance decline the minute you finish the installation, turn your back and walk into the house to enjoy the fruits of your labor. Wind, rain, snow, ice, and the heat of summer conspire to degrade your satellite viewing pleasure and you can't stop it.

So, here it is, the middle of summer and you've just run out of excuses for why you shouldn't go out there and peak the dish. Even if you don't think your signal has degraded since last summer when you put your system in, go through this little exercise and you'll be amazed at how much things have slipped.

■ At War With The Insect World

There are several ways to go about peaking up your dish. You don't necessarily need any special equipment but there are one or two things which may make it easier. I'll get into that later, but first you should ascertain that there are no insects setting up housekeeping in your feedhorn. Wasps just love to build nests in the mouth and, if you don't have a throat cover, the throat of the feedhorn. The best way to get rid of them is to wait until it's nearly dark and all the little wasps have come home for the evening to enjoy the company of the rest of the nest residents. Now give the whole lot a good soaking with Raid Wasp Killer (the kind that shoots a twelve foot stream).

It's curious that wasps would want to build nests directly on the probe (the actual antenna) of the feedhorn. One would think that the concentration of microwaves would fry them. Yet they do build there and with no apparent problems. The other curious thing is that the probe rotates 90 degrees as it changes polarity and you can imagine the thrill it must be to have your entire house rotated 90 degrees in the space of about one second. This, too, apparently fails to deter them.

While you're out there with the bug spray, check the back side of the dish and mount for



Apex Satellite Signal Meter. Actual size, the relative reading signal strength meter can help you peak your dish to deliver more signal to your receiver with a minimum of insanity. (Courtesy Apex Electronics)

similar wasp installations. You'll need to clear them all out before attempting to peak the dish.

Spiders sometimes like to build their webs across the feedhorn or, if you have a tripod feed support, the struts of the support. The effects of the web are not readily noticeable but in the evening as the dew falls the web may actually become a thick screen of water which deflects microwaves and deteriorates your signal. Clear out those spiders!

■ A Method To The Madness

Now that you've won the battle of the insects let's get back to peaking. There are basically two methods to peaking your dish. The first requires no special tools; the second uses a special peaking meter and is slightly more accurate.

In the first method you'll need to round up a long extension cord, a portable TV, and your satellite receiver. Bringing all this out to the dish, and using jumpers to connect directly to the feedhorn and actuator motor you can, in fact, visually monitor the effects of the work you're doing. Now, this is a real pain. It's time consuming; if it's a sunny day it'll be impossible to see the TV screen; and it takes the better part of an hour just to set up and take down. The best part is that it's free and if you've got time to kill this will do the job.

The second method is to use a small meter which has been specifically designed to do the job. These devices are known as "peaking meters." Essentially these are relative signal strength meters specifically designed for the 1 GHz range, which is the output of the LNB at your feedhorn (950 to 1450 MHz).

With the meter the method is fairly simple. Shut off the receiver and bring the meter and a short (under 10 feet) 75 ohm coax with connectors out to the dish. Unplug the coax from the LNB and insert this into the input of the meter. Take the jumper cable and connect the output of the meter and the LNB.

Now go back into the house and turn on the receiver. There is usually an on/off switch on the meter which you can now set to on. There should also be a small knob to adjust the signal level. With the power at the receiver on, set the needle to about 4 or 5 on the meter. Now, any adjustment you make to the dish, feed support, or mount will register either a gain or loss of signal strength. It couldn't be easier.

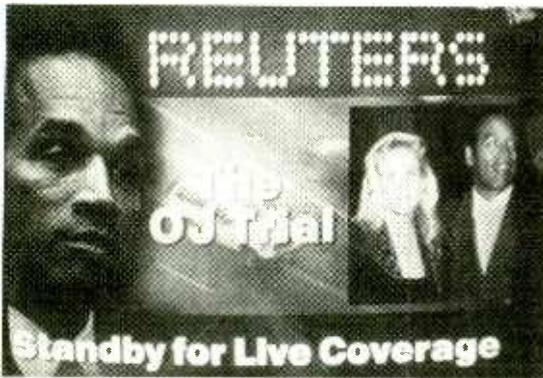
These meters range in cost from about \$60 to \$130. Ultimate peaking tools for professional satellite installers include spectrum analyzers, TV screens, and audio outputs. These range in price from \$1,000 to \$2,500.

■ Peaking Procedure

With your peaking meter in place, run your dish to the satellite which is closest to due south of your location. Set the receiver on a



Among the first transmissions aboard the new Orion 1 satellite at 37.5 degrees West is this billboard for WTN. Note Ku band frequencies. (Courtesy John Locker)



You can't get away from it. This live feed from Reuters of coverage of the O. J. Simpson trial shows that Europeans, too, settle in for their daily dose. (Courtesy John Locker)

channel with a strong video signal. Now go out to the dish and, observing the meter, lightly lift up and push down on the lip of the dish. If the meter deflects or rises with either motion then you need to adjust the inclination (follow procedures detailed in your dish/mount instructions) until a maximum reading is achieved.

Now run the dish to the satellite which is closest to due west. Again, tune to a channel with a strong video signal. Loosen the polar mount bolts which attach the mount to the mounting pole and nudge the dish left or right and watch the meter for maximum signal gain.

Finally, check the position of the feedhorn relative to the dish. It should be positioned precisely over the center of the bottom of the dish. If you have a "button hook" feed, check to see that the focal length is correct. Watch the meter during all such adjustments and peak to the strongest signal.

■ Keeping Your Sanity

The worst thing that can happen to you when you start this peaking procedure is that

somehow you'll blow it and the picture will actually be worse than when you started. To ensure that you can at least get back to where you were, do this: Take a black felt marker and draw a line straight across the various connections—e.g., the mount/pole. This way you can see exactly how much of a change you've made and can return to the place you started with ease. Make copious notes about exactly what you did and what the results were. If things start to get completely out of whack you'll need to be able to retrace your steps.

You're not looking for big changes. These peaking meters are very sensitive and can detect very slight changes which you may not notice on the video. The biggest change will be noted when you're tuning SCPC signals or satellites which are ordinarily difficult to receive such as birds to the East of Spacenet 2 or the Mexican satellites which are normally not strong at locations in continental North America.

The biggest difference will be seen on the Ku band. Because of the tighter reception requirements at 12 GHz, maximum peaking for C band will guarantee better pictures at Ku band.

■ The Locker Report

John Locker, our man in the UK, reports that "...the main orbital news is that 'Hotbird 1'—Eutelsat 2F6—has launched (28th March) and is on its way to 13 East. Eutelsat wants to put a total of four satellites in this slot to compete with Astra... Orion, at 37.5 West is up and running, with occasional video each day at high power levels... On March 22 Intelsat 705 launched due for 50 degrees West to replace the very wobbly 504. Further down the belt, Intelsat 506 is still working... quite well inclined, but using a tracking programme it's easy to predict when it will come into range. At present it has just one Ku transponder which is used by CNBC to feed programming over to Europe for 'NBC SuperChannel' on 13 East and Astra 1D. It's interesting to watch the Jay Leno Show being sent over as the U.S. ads are left in!"



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Summer Strategy

Summer is no time to give up on the low bands! Yes, the noise levels will be a bit higher, but summertime also brings with it some listening opportunities that may not be possible at other times of the year. This month, let's cover some tips to keep you going strong through the dog days of July.

■ When to Listen

The longwave band has traditionally been associated with nighttime listening, but keep in mind, if signals don't travel as far during the day, then neither will the static crashes from regional storms. For this reason, daytime listening can be quite profitable for close-in and medium distance signals.

When conditions are quiet, you may be surprised how well the band behaves. In particular, try listening from the early morning till about 10:00 am. At these times, the atmospheric noise is frequently lower, and there may be some DX signals hanging on from the nighttime hours.

You may also want to concentrate on higher-powered beacons during the summer months. Canada, for example, has a large number of beacons running 400 watts or more, and these can be fairly easy warm-weather catches for those living in the Northern U.S. It might be interesting to see just how far you can hear a beacon during the daytime.

■ Close to Home

Summer is the perfect time to go mobile and search out some of your local beacon sites. It's a great way to sharpen your direction-finding skills and it's a fun way to attach an image to an ID that you've been hearing on the air.

Most portables use a built-in ferrite rod antenna for longwave reception and it can be used for basic DFing as follows: Orient the set for a null (dip) in the received signal level. Once the null is obtained, look along the lengthwise dimension of the receiver cabinet. One end of the cabinet will now be pointing in the direction of the transmitting station.

To determine which end is pointing to the beacon transmitter, you may have to take two or more readings separated by a few miles. The headings can then be plotted on a map to show the intersecting point. This will indicate the approximate location of the transmitter.



When you've found the beacon site, why not snap a picture and send it to us—you could see your catch in *MT*!

■ On the Road

Going on a vacation this summer? Why not take your receiver along for some on-the-road DXing? This is a sure way to add some new beacons to your log. You may even be able to visit a beacon site up close that is just a faint signal back home.

Summer is also the ideal time to take an outdoors DXpedition. You could combine this with camping activities, using it as an opportunity to escape the man-made noise of urban and suburban settings. With today's low-power circuits, it should be a cinch to go all-battery powered, which will further help reduce the noise.

Summer is the ideal time to do some antenna building or maintenance. You'll want that skywire to be in top shape for the upcoming season of quieter band conditions.

Finally, when the conditions are just too rough for pleasurable listening, the summer months are also a great time to check out the flea markets and hamfests

in your area. You'll find all kinds of radio goodies at these events. I'm amazed at the number of old-time radio and electrical books that can be found, even at non-radio flea markets.

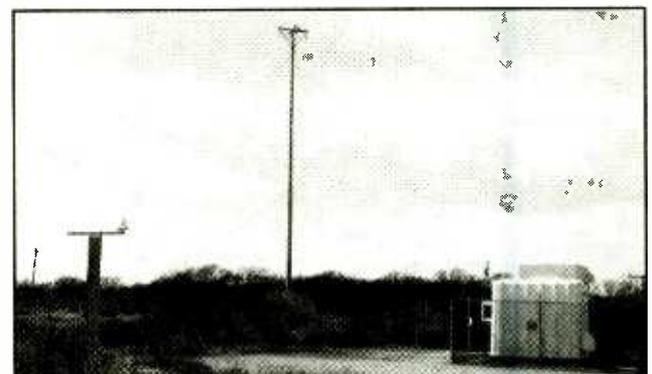
I hope this gives you some ideas for getting the most out of your summertime listening. Above all, remember that radio is a hobby and that summer is also a great time to enjoy special times with the family!

MAILBAG

- Charles Bernth (NY) has been busy tracking beacons near his home and he's successfully located **MP** (293 kHz) at Montauk Point, NY (see photo). The current structure and antenna are actually the third installation at this troubled site. The previous two were washed away by erosion, as the beacon is on a bluff overlooking the Atlantic Ocean.

Charles observed that the current site is only about 100 feet from the edge of the bluff, and it, too, may be in danger of erosion. There is some stabilization going on, so hopefully this will keep **MP** on the air for a long time to come.

- Since upgrading to a new receiving setup, Robert Follett (UT) has managed to triple his log entries. His best distance per watt seems to be **MRK** (338 kHz, 25 watts) in Rayville, LA, but Robert also managed to snag his first trans-polar DX with **SAA** (263 kHz) in Pos'Yeta, Siberia. Although this Russian beacon is high power (4000W), it is still a DX catch to be quite proud of.



The Montauk Point, NY beacon site—"MP" (293 kHz). Photo by Charles Bernth (NY)

TABLE 1

Beacon Loggings

FREQ.	ID	LOCATION	BY
194	TUK	Nantucket, MA	A.H., RI
198	DIW	Dixon, NC	A.H., RI
201	GL	La Grande Rivere, QUE	A.H., RI
201	YKX	Kirkland Lake, ONT	A.H., RI
203	AEW	Biscane Lake, FL	A.H., RI
203	RED	Red Lodge, MT	R.F., UT
204	GB	Buffalo, NY	A.H., RI
204	YFY	Iqaluit, NWT	A.H., RI
206	GLS	Galveston, TX	A.H., RI
206	GLS	Galveston, TX	R.F., UT
206	QI	Yarmouth, NS	A.H., RI
207	YNE	Norway House, MAN	R.F., UT
209	AEC	Mercury, NV	R.F., UT
209	IB	Atikokan, ONT	R.F., UT
211	HDG	Gooding, ID	R.F., UT
212	DBX	Washington, KS	R.F., UT
212	PMX	Palmer, MA	A.H., RI
212	TS	Timmins, ONT	A.H., RI
216	CLB	Wilmington, NC	A.H., RI
220	HLE	Hailey, ID	R.F., UT
221	RQM	Rangely, ME	A.H., RI
222	FDR	Frederick, OK	R.F., UT
227	ASE	Aspen, CO	R.F., UT
227	BE	Bangor, ME	A.H., RI
227	LA	Lakeland, FL	A.H., RI
230	BI	Bismark, ND	R.F., UT
233	OKS	Oshkosh, NE	R.F., UT
233	PPK	Palisades, NJ	A.H., RI
241	PVG	Portsmouth, VA	A.H., RI
245	CRR	Circle, MT	R.F., UT
248	MO	Mobile AL	P.C., VA
251	LUG	Lewisburg, TN	P.C., VA
254	RA	Rapid City, SD	R.F., UT
256	UNV	Nuevas, CUBA	A.H., RI
260	BYN	Bryan, OH	A.H., RI
263	SAA	Pos'Yeta, Siberia	R.F., UT
266	CQJ	Asheboro, NC	A.H., RI
275	ING	Philadelphia, PA	A.H., RI
278	SB	Salisbury, MD	P.C., VA
287	MKP	McKeesport, PA	A.H., RI
289	CB	Cape Henry, VA	A.H., RI
323	SRC	Searcy, AR	P.C., VA
335	CDH	Camden, AR	R.F., UT
338	MRK	Rayville, LA	R.F., UT
348	UHA	Havana, CUBA	A.H., RI
349	GW	Greenwood, MS	R.F., UT
400	FN	Ft. Collins, CO	R.F., UT
406	FLR	Fall River, MA	P.C., VA
526	ZLS	Stella Maris, BAH	A.H., RI

Robert's main station is an NRD535SE receiver with a DSP filter and a homebuilt active antenna. On occasion, he also uses a Lowe 225E with a 400 foot mini-Beverage antenna.

Survey Update, Loggings

I want to thank everyone who returned a Below 500 kHz survey. The comments received will be very helpful in maintaining the column's quality. I am compiling the responses and will present a summary of the results in the August issue.

One thing that was clear from the survey is that people would like to see even more longwave loggings. So, this month I've included a multi-state listing of beacons supplied by three MT readers: Perry Crabill (VA), Robert Follett (UT), and Al Hemmalin (RI). The contributors are identified by their initials as well as their state in Table 1.

End Notes

It's the lament of builders everywhere. RF-components are getting harder to find. If building is your thing, you'll want to have a copy of the *RF Parts* catalog. Their brochure lists dozens of hard-to-find parts including tubes, transistors, and variable capacitors—many of which are suitable for longwave projects. The prices are reasonable, and these folks can ship overnight if you wish. They also welcome foreign orders.

You can write RF Parts for a catalog at: 435 South Pacific St., San Marcos, CA, 92069, or call (619) 744-0750 (FAX-619-744-1943).

That wraps it up for another month. Enjoy the nice weather and I'll see you in August.

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Nostalgia Gear

The last few years have brought an increased demand for older ham gear. Prices have gone through the roof, and even mediocre pieces are going for fairly high prices. For example, at a recent hamfest a Hallicrafters SX-20 was offered for \$150.00. I have no way of knowing if anyone would be seriously interested in this unit at that price, because just last year I purchased one for only \$20.00.

It does seem older gear is a good investment, especially if it is in good working order. Names like Collins, National, Johnson, and Hallicrafters are the units to be on the lookout for. Also, if the price is right, don't pass up a piece of Gonset or Drake gear. I hesitate to say what a good price would be, as the situation seems to change rapidly, but it's always going up. As the summer hamfest season continues, I will try to gather some typical prices for the more popular gear.

Speaking of nostalgia gear, the happy guy in the photo is W3BPZ, Chick Dressel of Allentown, PA, classic gear collector extraordinaire. I took this photo originally to illustrate the differences between 1950's VHF gear and modern VHF equipment. The square box Chick has his arm draped over is a Gonset Communicator, a 2 meter portable (available on 6 and 220, too). You could tell it was portable only because it had a handle on top. The Communicator, or "Gooney Box" as it was affectionately called, was the rig for 2 meters in the mid-fifties. The Gooney ran 8 watts on 2 meter AM; it could also be put on MCW (but not CW). It was crystal-controlled, and could be powered by 110 vac or from the car, via a built-in vibrator power supply.

Generally speaking, when mobile, average range was about 5 miles. If run in a home station or portable at a high location and a good beam, it was possible to work stations a couple of hundred miles away under good conditions. There were no repeaters in those days, so everything was simplex.

Compare this to the 2 meter HT you see sitting on top of the Gooney in the photo. The HT puts out 5 watts, has full coverage of the two meter band, and can be used to work stations easily in a 50-mile range via repeaters, plus it is possible to use the rig to directly access a telephone via auto patch (never dreamed of with the Gooney) and link to repeaters on other frequencies. Compare the

size of these two rigs! It's possible to fit a dozen or more of the HT's inside the case of the Gonset. The really amazing thing about all this is that the price of the Communicator was \$209 (an impossible sum for lots of us in the 50's) whereas the HT can be purchased for around \$200-250 of 1995's mini-dollars (a true bargain indeed)!

Checking out Chick's shack again you will note several other pieces of older ham gear. This is just part of the W3BPZ collection; all of the gear is in top-notch working order, and when working Chick you might be listening to almost any kind of rig. As Chick is fond of saying, "real radios glow in the dark"!

■ I.C. Engineering

For years I have used field strength meters (FS meters) for a wide range of purposes, mainly checking on how well my antennas are working. The major problem with the average FS meter is that it does not have any real means of calibration, so everything is sort of "well, it seems better or worse."

I.C. Engineering has recently introduced the "DIGI FIELD" FS meter. The unit is calibrated, and operates from DC to 12GHz. Here are a few of the possible applications: developing or adjusting antennas, observing the radiation patterns of antennas, measuring TV coax distribution loss in a building, detecting electronic instrumentation cross-talk due to RFI/EMI, measuring microwave oven leakage or TV and computer radiation, determining RF level in a radio environment, sniffing 60-cycle noise from motors, measuring RF level in equipment resulting from different grounding methods, demonstrating antenna polarization, and functioning as an RF safety monitor, a power meter for very low power, or a transmitter locator for T-hunts.

There are three different models of the DIGI FIELD available; model A



Chick Dressel demonstrates how 2-meter portable rigs have changed!

features the ability to calibrate a signal, model B is more sensitive, and model C combines A and B. Price for model A or B is \$139.95; model C is \$185.00 plus \$6.50 shipping in US, AK, and PR. Outside US please write. Available from IC Engineering, 16350 Ventura Blvd. Suite 125, Encino, CA 91436.

■ Nostalgia Trivia

Did you know it took a murder to convince the world the telegraph was a useful instrument? In 1837 Charles Wheatstone and William Cooke developed a six-wire telegraph system and installed some short lines for demonstration purposes. They hoped to sell it to the British railway system. The rail officials were not impressed.

However, in 1844 a woman was murdered in Salthill, England, by a man who boarded a train for London. Police telegraphed ahead a description of the murderer, who was captured by London police and eventually was convicted and hanged. News of the event made headlines confirming the usefulness of the telegraph. (Taken from *Morse Code: The Essential Language* by Peter Carron Jr, W3DKV.)

■ VHF

July should be a great month for DX on VHF. The Es season should be in full swing, so ex-



DIGI FIELD FS Meter

pect a lot of fun on six meters and above. Your best bet is to keep an eye on the lower TV channels; when you see ghost signals appearing, start checking the bands. Another good bet is to keep an ear peeled for the various beacon stations on VHF. If you get a chance,

grab the VHF gear and head for a high spot and make your own openings.

Have lots of summer fun and stay out of the poison ivy. See ya next month. 73 de Ike, N3IK

Rob Leonard's Ham DX Tips

July is the month when a ham band DXer starts dreaming of islands. This is because the month of July produces more DXpeditions to islands than any other month, thanks to the Islands on the Air Contest which takes place the 29th and 30th. Here are some tips we hope will add a few new exotic island locales to your log as well as other information that we hope you will find interesting...

ALASKA Having exhausted the regular prefixes of AL7, KL7, NL7, and WL7 for amateurs here, the FCC has begun issuing callsigns using any numeral (1 to 9) following either an AL, KL, NL, or WL as the prefix (except the block KL9KAA to KL9KHZ, which, though not presently used, is still reserved for US military personnel in Korea) **ARGENTINA** LU7FJD (Frederico J. Traid, PO Box 66, 3016 Santo Tome, SFE Argentina) has been on 28470 to 28480 kHz SSB most days around 0100 UTC. **CONTESTS** July 17th and 18th the annual *CQ Magazine* VHF contest starts at 1800 UTC on the 17th for 24 hours. Look for SSB, and CW stations operating in the lower portions of the VHF/UHF amateur bands, and others on the FM simplex frequencies. Exchange will be Grid Square location and callsign. July 29th and 30th, the *Islands on the Air* contest SSB frequencies are 160 to 10 meters (excluding the WARC bands). Amateurs around the world try to work others located on islands located in the seas and oceans of the world. Exchange is signal report, callsigns, and, if on an island, the IOTA reference number. **DENMARK** OZ/DL2HEB/p will be active CW only 80 to 10 meters from Laesoe Island (IOTA # EU-088) July 10th to 29th. He will not be active in the IOTA contest, though. QSL to his home address: Ullrich Swoboda, DL2HEB, am Felde 93, D-22765 Hamburg, Germany. **DX NETS** 8R1WD advised that he participates in a Caribbean DX net that meets each Tuesday on 14190 kHz at 0000 UTC. **HAWAII** As the callsigns in the AH6, KH6, NH6, and WH6 prefix blocks are being used up, the FCC recently announced it will start issuing callsigns beginning with AH7, KH7, NH7, and WH7 to amateurs located in Hawaii. **ISRAEL** FX6TT (Amir Bazak, 4 Trumphedor St., Ramat Hasharon 47264, Israel) has been pleasing DXers by appearing on 18140 kHz SSB almost daily at 1815 UTC and on 10105 kHz CW at 23330 UTC. **KURE** As amateurs in Hawaii are issued the KH7 prefix, new callsigns operating from this island/DXCC country will be given the prefix KH7K to distinguish them from the Hawaiians. **PUERTO RICO** The FCC will soon begin to issue callsigns using the prefix KP3, NP3, and WP3 to hams located here. **ST. PAUL ISLAND** WA4DAN (Murray D. Adams, 403 East 14th St., Greenville, NC 27858) advises that he, KW2P, W5IJU, and AA4VK will all be active from this Atlantic Canadian island located east of the mouth of the St. Lawrence River July 17th to August 2nd. Each participant will use his own callsign amended with /CY9. Operation will be 160 to 6 meters SSB, CW, and RTTY. QSL contacts or reception of all the operators to WA4DAN. **SOLAR PREDICTIONS** *The West Coast VHF'er* newsletter recently carried the prediction by JA1VOK, editor of *World VHF News*, that Sun Spot Cycle 23 will peak in the fall of 1999 or early in the year 2000 with a maximum solar flux just short of 2000—which gives us all something to look forward to in these low flux days. **SPAIN** On the air for the IOTA contest weekend of the 29th and 30th, will be ED1URS from Isla del Moro (IOTA # EU-016) off Spain's Atlantic Coast. The Spanish amateurs involved in this operation will be active around the clock on 160 to 10 meters. Their QSL route will be given on the air. **USA** WA3WJD (Brian McGinnes, 4618 DeRussey Pkwy, Chevy Chase, MD 20815) and AA3HA (Mark Woodruff, 14028 Bromall Ln., Wheaton, MD 20906) will operate from Assateague Island (IOTA NA-139) off the coast of Maryland. They say they will have a kilowatt on each band 80 to 10 meters. QSL to the home address of each operator. Good DX and a Happy Canada Day or Independence Day, whichever is appropriate for you! 73 de Rob

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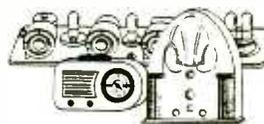
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"Patriot" Programming Attracts Scrutiny

Following the tragic Oklahoma City bombing incident, semi-clandestine right wing programming on licensed United States shortwave stations was unexpectedly thrust into the national spotlight. All major television networks interviewed shortwave talk show hosts during their regular news coverage. The *New York Times* even printed the 5065 kHz frequency of **WWCR** in Nashville.

At the center of this sudden controversy was Mark Koernke, host of "The Intelligence Report" program on **WWCR**. Dozens of media reports linked Koernke to a cryptic fax message received by Congressman Steve Stockman (R-Texas) shortly after the Oklahoma bombing.

Koernke, in several immediate appearances on national television, quickly denied any involvement in the bombing. But, during his daily **WWCR** program at 0000 UTC, he claimed that the United States government had plotted to blow up its own building in Oklahoma. The *New York Times* quoted Daniel Levitas, a writer on right wing political groups, saying, "What Koernke is, is a leader of a paramilitary right wing movement who is using communications technology to advance the militant violent objectives, to recruit and communicate."

Broadcasting and Cable reported that the FCC was investigating **WWCR** because of Koernke's on-air remarks. They cited FCC lawyer Tom Albers, who pointed out that United States regulations limit shortwave broadcasters to international transmissions. Koernke's program, obviously targeted primarily at a United States audience, potentially violated this often-ignored FCC rule.

Subsequently, **WWCR** removed Koernke's program from its broadcast schedule on April 28. A **WWCR** press release defended freedom of speech in the USA, but said that the station had decided to be both "conservative and responsible." The release said that "the adverse publicity against programs of this nature in the aftermath of the Oklahoma City bombing and indiscriminate killing of innocent people including children, has caused us to reconsider our responsibility as a broadcaster."

Viking International Trading of Scottsdale, Arizona, an investment company specializing in coins, had been sponsoring Koernke's "The Intelligence Report" show. They expanded their own

WWCR program to a two-hour block as a Koernke replacement during the 0000 UTC time slot. On many programs after April 28, Viking talk show hosts claimed that **WWCR** had buckled under intense pressure from the FCC when it cancelled Koernke's program.

■ Impact on Shortwave

Shortwave broadcasting had not generated such intense press scrutiny since the Gulf War. Suddenly the medium attracted attention from virtually all major press news organizations. Even President Bill Clinton called for talk show hosts to tone down the venom of their rhetoric.

The right wing political programs on licensed USA broadcasters such as **WWCR**, **WRNO**, **WHRI**, and **WINB** are not literally clandestine programs, since they buy time on licensed shortwave broadcasters. But, their strong anti-government tone placed some of them on the defensive following the Oklahoma City bombing. On the other hand, the saturation coverage by national media organizations probably increased the shortwave listening audience in the USA, at least temporarily.

If you're checking out these programs, you will notice that **WWCR** now identifies itself with the following announcement, "Broadcasting Christian and super-patriot programming from the free world to the whole world, we're international shortwave radio **WWCR**, Nashville, Tennessee." The "patriot" shows are concentrated in the evening on their normal frequencies, 5065 and 7435 kHz.

■ RNI Returns

The right wing political shows are not the

only controversial figures carried on **WWCR**. Allan Weiner, longtime veteran pirate broadcaster and the driving force behind Long Island shipboard pirate **Radio New York International**, has returned to the shortwave bands with a regular show on **WWCR** at 0400 UTC Mondays. Weiner, recently notorious for his involvement in the incident where the FCC busted Brother Stair's m/v *Fury* in Charleston harbor for alleged unlicensed broadcasting in early 1994, is once again producing his unique blend of free speech and pirate radio advocacy.

Anita McCormack, *MT* reader and noted shortwave author, reports that Weiner's first show was interesting. He recounted the *Fury* incident at length, denouncing the FCC for spending nearly \$100,000 of taxpayers money while destroying the vessel's transmitters.

■ Poland Fighting Pirates

Although we can't hear the stations in North America because they broadcast on the FM and AM mediumwave broadcast bands, dozens of unlicensed broadcasters in Poland continually battled Polish governmental authorities during the spring months of 1995. According to BBC Monitoring Service, new Polish legislation granting broadcasting "franchises" has been widely ignored. Polish Minister of Justice Jerry Jaskiernia said that at least eight pirates were broadcasting without franchises, while nearly three dozen newly franchised stations were broadcasting on frequencies not assigned to them.

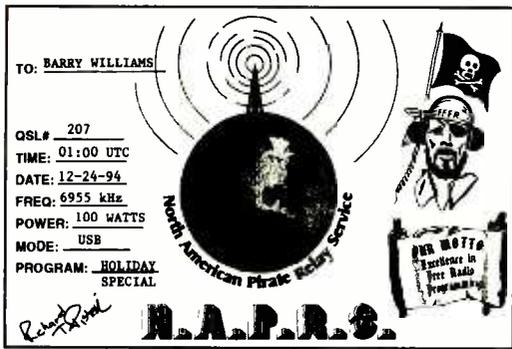
The National Radio and Television Broadcasting Council (KRRiTV), a new Polish equivalent of the USA FCC, has closed down several of the newly designated pirates. However, many remain on the air despite threats of additional closures. BBCMS reported that after the KRRiTV silenced two pirates in Konin—Radio RRM and Radio 66—several thousand local residents signed petitions protesting the government's action.

■ Iranian Clandestine

Stan, the operator of Russian pirate station Radio Magic, is well known to North American DXers. His productions of rock music have frequently been relayed by pirates on this side of the

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Is this a Europirate or a North American hoax?



Dr. Pistek's "permanent" retirement lasted three months.

Atlantic, and Stan is an excellent verifier of reception reports. He's also a DXer in his own right, and he sends in a clandestine tip.

The Radio Magic host says that he regularly hears broadcasts from the Voice of Iranian Kordestan on 4282 kHz between 0315-0430 UTC. This one is audible in North America, although BBCMS reports that the activity level from the radio voice of the Kordestan Democratic Party of Iran has been erratic during 1995. Between mid-March and late April it was silent, but it now is heard on its alternate frequency of 4160 kHz. A second one hour broadcast at 1430 UTC is inaudible on 80 meters in our part of the world during daylight hours.

■ WRMI E-mail Address

Jeff White of WRMI on 9955 kHz, who carries several different anti-Castro quasi-clandestine programs, reports that the station can now be contacted via computer e-mail. The station's CompuServe connection can be reached at 71163.1735@compuserve.com via the internet. This is a quick way to pick up their latest schedule or to communicate with Jeff. *MT* reader Ulis Fleming of Maryland tried this out, and he reports that it works!

■ What We Are Hearing

North American pirate stations reported by our readers this month use the following correspondence maildrops: PO Box 452, Wellsville, NY 14895; PO Box 109, Blue Ridge Summit, PA 17214; PO Box 28413, Providence, RI 02908; PO Box 3913, Schenectady, NY 12303; PO Box 40554, Washington, DC 20016; PO Box 25302, Pittsburgh, PA 15242; Boite Postale 130, F-92504 Rueil-Malmaison, Cedex, France; and PO Box 3103, Onekawa, Napier, New Zealand. When writing to a pirate, three mint postage stamps are required to defray mailing costs to USA addresses. Foreign addresses require \$1.00 US for the same purpose. Frequencies are given in kHz, with times in UTC.

He Man Radio- 6955 at 2315. He Man's spring transmissions tended to deemphasize his male supremacy format in favor of ads for his station t-shirts. Details on shirt availability are available for an SASE to his maildrop. Addr: Blue Ridge Summit. (William T. Hassig, Mt. Prospect, IL)

Hit Parade Radio- 7412 at 1645. When I first heard their recent show featuring Creedence Clearwater Revival, I couldn't fish out an identification. But, in a couple of weeks, Dale Dorman's station was ID'ed in the *Pirate Pages* bulletin. An SASE to Blue Ridge Summit will get you current subscription information for this biweekly newsletter, which is an ANARC affiliate club. Addr: Wellsville. (George Zeller, Cleveland, OH)

KIWI- 6956 at 0100. Graham Barclay's New Zealand pirate is still heard occasionally on weekend evenings around 0700 UTC on 7445 kHz, but William heard them with a better signal via a North American relay. They usually feature diverse pop music and pirate radio advocacy. Addr: Napier. (Barry Williams, Enterprise, AL; Hassig)

KXXX- 6956 at 0100. Major Spook and Rev. X host this new rock music station that uses the slogan "Extreme Pirate Radio." They use an endless tape of laughter as an interval signal. Addr: So far, none. (Zeller)

North American Pirate Relay Service- 6955 at 2300. Earlier this year, Dick Pistek announced the permanent retirement of NAPRS. Well, "permanent" lasted about three months, and Dick has been back with test transmissions and original programming. This is a welcome development. Addr: Wellsville. (Don Kidder, Ashland, ME; Hassig)

Outlaw Radio- 6955 at 2245. This new one combines rock music, sound effects, and frequent sirens with a female announcer. She claims to broadcast from FCC headquarters in Washington, DC, but this is doubtful. Addr: Providence. (Hassig; Williams)

Radio Airplane- 6955 at 0000. As Bob Grove pointed out in the May *MT*, the FCC intends to close most of its field offices. Bob didn't like this move in his *MT* editorial, but the decision will meet with the full approval of Pirate Captain Eddy. Addr: Wellsville. (Hassig)

Radio Albatross- We have just learned that Pirate Mike, the quasi-pirate who aired his productions via **Radio Copan** in Honduras, recently passed away. Our sincere sympathy and condolences go to Pirate Mike's family and associates.

Radio Azteca- 7412 at 1315. Bram Stoker continues to produce original and hilarious parodies of shortwave DXing and DXers. A new show has appeared about once every other month since 1992. Addr: Wellsville. (Zeller)

Radio USA (fake)- 6955 at 2145. I found a logging of this one sent in by Skip a couple of months ago. This reminded me that we haven't heard all the parody stations and fake stations imitating **Radio USA** for a couple of months. Maybe the fad will disappear. Addr: Providence. (Skip Arey, Waterford Works, NJ)

Southern Music Radio- 7435 at 0000. Rob says that it took 14 months to arrive, but David Miller eventually verified a report for this New Zealand pirate via a **CSIC** North American relay. Addr: Wellsville. (Robert Ross, London, Ontario)

Sunshine Radio International- 6961 at 2100. This station's announcer (Max) programs typical

Europirate rock music fare, but he's better heard in our part of the world lately because he has established a programming relay relationship with North American pirate transmitters. Addr: Rueil. (Williams)

Tangerine Radio- 6956 at 2300. Raunchy Rick had been dormant for a long time, but the return of his original anarchist station to the airwaves a few months ago was welcome news. Rob found that Rick still verifies with his traditional orange QSL card. Addr: Wellsville. (Ross)

Up Against the Wall Radio- 6955 at 0045. Owsley still uses an "oogah" horn interval signal. William says that the proper term for a horn like this is a klaxon horn. Addr: Wellsville. (Hassig)

Voice of Scotland- 6273 at 2300. Rumors circulated in various hobby bulletins that this alleged Europirate actually operated via a North American relay last October. But, the QSL pictured this month from Rob Milne is arriving with a United Kingdom postmark. John T. Arthur in *The ACE* speculates that the station really did come from Europe. Sometimes we never know for sure. Addr: Providence. (Zeller)

Vox America- 6956 at 0100. After sporadic activity in 1994, this station has exploded in 1995 with an excellent AM signal and reasonably consistent activity. They feature well-produced rock music and comedy sketches. Note their unusual maildrop. Addr: Schenectady. (Hassig; Williams; Kidder)

WBNY- 7413 at 1730. Every year Commander Bunny fires up his transmitter at Easter to urge a rodent revolution, supported by the People's Committee in Solidarity with Rodent Freedom Fighters. He was logged again this year by multiple DXers, but I've never managed to hear this excellent clandestine parody station. There's always next year. Addr: Washington. (Zeller)

WLS- 6875 at 1400. Jack Boggan's interval signal music station has joined a few others on this relatively new frequency. It has supported increasing levels of pirate broadcasting, especially on Sunday mornings. Addr: Blue Ridge Summit. (Williams)

WREC- 6957 at 2345. P. J. Sparx is back after a couple of months of dormancy. His anniversary show was somewhat unusual, since it featured guest announcer Phil Muzik from longtime veteran pirate **KNBS**. Addr: Blue Ridge Summit. (Williams; Hassig; direct from the station)

Award Winning Antenna



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The Ultimate Scanner

After nearly a year of anticipation, Bill Cheek's new scanner modification handbook, volume 3 (a change of publisher mandated a change in title to *The Ultimate Scanner, Cheek 3!*) is finally here. Can any work stand up to this kind of build-up? What radios will The Master cover? What new advice will he impart? Who will he verbally assault for the pure pleasure of it—and what outrageous thing will he say? Like Cheek or not, you have to admit two things: he has honed his in-print "persona" to the level of theater, and secondly, he knows his stuff.

Well, now you can relax: *The Ultimate Scanner, Cheek 3!* is excellent.

In the first chapter of *The Ultimate Scanner*, Cheek spends most of his time telling you about the importance of computers in the radio hobby. Most of this is the usual mix of compelling fact and exaggerated hyperbole of a zealot. Chapter two is where things really get going. There are a lot of definitions, the ground rules are spelled out, and Cheek entices readers with some of the things that an ultimate scanner could and perhaps should do.

This is where Cheek begins to shine. Even if you've never, in your wildest dreams, thought about digging around inside your scanner with a screwdriver, this will make you want to. His discussion of scanner economics

makes a convincing argument for why scanner manufacturers aren't often on the cutting edge of the industry.

Chapter 3 is a general review of the basics, including general tips, hints and kinks—all highly recommended reading for anyone who dares to do surgery on a scanner. Chapter four is dedicated to memory mods, followed by chapters on subsidiary carrier authorization (SCA), data tone squelch, cellular mods "and other wizardry" and, in chapter 8, it's back to interfacing scanners with computers.

According to Cheek, the ultimate scanner must be wired to a computer and Cheek spends another chapter on the subject—the largest in the book. Chapter 9 covers electronic facts, figures and formulas, from Ohm's Law to formulas indicating free-space and diffraction loss. The book closes somewhat abruptly, with a wild Cheek rant: "I've gotta stop writing. My publisher just broke in, menacingly waving a wicked-looking pistol with a barrel so big you could stick a mop handle in it, shouting something..."

The cautions are few. One, you should be advised that *The Ultimate Scanner* is not entirely a stand-alone book. It's a serial effort, meaning that it wouldn't hurt to have *Scanner Mod Handbooks* volume 1 and 2 in order to get everything you need from volume 3.

Two, if you're looking for specific information on scanners other than the PRO-2004, '5 or '6, for the most part you're going to be disappointed. The '2004 is, according to Cheek, the best radio ever made and therefore deserves the lion's share of the hacker's attention. He does give readers with other scanners some hints on how to lateral-engineer mods from the '2004.

Three, Cheek dramatically overestimates the importance of

hacker-level computing to the average radio hobbyist. I'll probably be judged a real simpleton for saying so, but I'm afraid that, like all visionaries, Cheek sees the potential of his subject matter in a sort of intellectual tunnel-vision. Most of us working slobs haven't the time to spend poking around inside radios, even though he, as a full-time-and-then-some professional, has done much of the experimentation for us.

So, is Bill Cheek's *The Ultimate Scanner Cheek 3!* worth the wait? You bet. The book explodes with information and an emotional electricity born of passion, even obsession. *The Ultimate Scanner* is one of the best, most practical, scanner technical books of the decade—at least, until *Cheek 4*, a book virtually promised in *The Ultimate Scanner, Cheek 3!*

The book sells for \$29.95 from publisher Index Publishing (3368 Governor Drive, Suite 273M, San Diego, CA 92122), and or your favorite radio book seller, including Grove Enterprises.

The Whole Spy Catalog

There is a little James Bond in all of us, and Lee Lapin for a decade or more has been fueling the fire of our imaginations with his books on bugging, surreptitious entry, wiretapping, personal location, booby traps and other titillating topics.

But this time Lapin has unleashed a ptoime, well over 400 pages of resources on investiga-

tion, espionage, surveillance, intelligence gathering, countermeasures, unauthorized entry, tracking competition, privacy measures, computer networks, spies, and counterspies, and more.

This is not a how-to book, although the author does have running commentary throughout the work. He describes it as "the ultimate guide for finding information and intelligence on (damn near) anything." And that it is.

The Whole Spy Catalog is \$44.95 from book dealers; for one near you, or to order from the publisher, call Intelligence Incorporated, 415-851-3957, or write them at 2228 South El Camino Real, #349, San Mateo, CA 94403.

—BG



Understanding Shortwave Propagation

For most casual shortwave listeners, all you really have to know about propagation is that when it's good, you can hear more stations and when it isn't good, you get very frustrated.

Reading *The New Shortwave Propagation Handbook* can help you avoid lots of wailing and gnashing of teeth. This new book by George Jacobs, Theodore J. Cohen, and Robert B. Rose is the definitive work on propagation. Chapters include principles of ionospheric propagation, sunspots and the sunspot cycle, sun-



spot cycle predictions, and even do-it-yourself propagation predictions and master propagation charts.

Whether you're an amateur looking to contact a friend on the other side of the world, or an SWL trying for that elusive station, this book will give you the tools to make your hunt successful. *The New Propagation Handbook* is published by CQ Communications, 76 North Broadway, Hicksville, NY 11801. The price is \$19.95 plus \$4.00 shipping.

PropMan

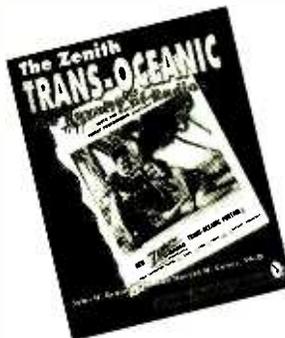
This is truly a unique opportunity to tap into a high-level source of radio data. Rockwell Defense Electronics is best known for providing high frequency communications products and systems to the Defense Department and commercial aviation. Now, Rockwell has of-

fered its expertise to regular folk like you and me.

Rockwell's PropMan propagation software, used by the US and foreign governments around the world, permits a user to determine the best frequencies on which to communicate between two selected locations anywhere. The software takes into account such things as day of year, time of day, station equipment, and ionospheric and solar information. Using graph and table formats, the program analyzes HF frequencies, allowing you to pick the best one for your needs. With a telephone line connection, PropMan can even translate and plot real-time satellite data from the Space Environmental Services Center to enhance propagation details.

Calculations typically take less than 30 seconds. PropMan runs on 286 or higher processors (math coprocessor highly recommended), color VGA screen, and

two megabytes of conventional memory. Priced at \$49.95 plus tax, PropMan comes complete with two 3.5 inch diskettes, a quick start guide, and operator's manual. For more information or to order, contact Rockwell Electronics, 1-800-321-2223.



The Zenith Trans-Oceanic

Few radio sets have enjoyed the mystique and popularity of the Zenith Trans-Oceanic, a se-

ries of models made for nearly four decades, from pre- to post-war. The models were handsome, solid, and good performers, earning their reputation as a standard of excellence.

John H. Bryant and Harold N. Cones have prepared an outstanding dedication to the Trans-Oceanic with their new book, *The Zenith Trans-Oceanic: The Royalty of Radios*. The book is a collector's dream, lavishly illustrated throughout its 160 glossy pages. Packed with nostalgic historical insights, and rich in both color and black-and-white photography of the radio era, the book is a monument to the golden days of American radio manufacturing.

The book is \$24.95 plus \$3 book rate shipping from Schiffer Publishing Ltd (77 Lower Valley Rd, Atglen, PA 19310-9717), and from Grove Enterprises and other MT advertisers.

—BG

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HTS-2 vs. HTS-3

by Larry Miller

Last year, the Naval Electronics HTS-2 silently disappeared without warning. Dealers were left high and dry. "Be patient," we were told, "the new HTS-3 is coming out."

To the manufacturer's credit, when we asked what the difference between the two units was, we were told, "not a thing." And indeed this seems to be the case, with the notable exception of price. The HTS-2 retailed for \$29.95; the HTS-3 retails for \$34.95. Even the board on the HTS-3 that we saw said "HTS-2."

The HTS-2 and 3 are billed as amplified speakers with "tape trigger." The amplified speaker is designed to cut through noisy environments, and the tape trigger allows you to hook your scanner to a tape recorder and tape the action when you're away from the radio. The scanner breaks squelch and the HTS-2 or 3 turns on the tape recorder. It sounds pretty neat. But there's one problem.

Back when DX Radio Supply first started selling the HTS-2's, a lot of people bought them for the tape trigger function. However, we soon started getting complaints. The problem is that while the tape trigger does trigger the tape recorder when the scanner breaks squelch, the way that your tape recorder picks up the audio from the scanner is not through a patch cord, but rather by placing the tape

recorder near the HTS-2, where the tape recorder's internal microphone picks it up.

We were astounded that there was no patch capability and told the manufacturer so.

When the HTS-3 came out, we thought that certainly a simple patch jack would be included. Wrong. The HTS-3 still requires you to put the tape recorder near the amplified speaker in order to record from your scanner. Say that you want to keep an ear on what's going on in your community overnight. You set up the HTS-3, scanner, and tape recorder, and in the morning, listen to a seamless tape of scanning action—no dead air at all. In theory, it's great. Practically speaking, however, all night while you're doing the taping, the speaker is blasting away. So much for getting any sleep.

The HTS-3 does amplify the speaker, and the fact that it seems to be heavy on high-end frequencies makes it likely to punch through noisy environments. In addition, there is a small, not-actually-for-consumers volume adjustment that can be made in the rear of the set if you pull off the battery cover.

In the end, the Naval Electronics Amplified speaker is simply not made for the scanner market. It's made for ham radio HT's and thus the HT product name. But with a very little amount of effort, it could be a top-rate, truly helpful accessory.

The HTS-3 is available from various radio dealers, including Grove Enterprises, and the manufacturer at 5417 Jet View Circle, Tampa, FL 33634. The phone is 813-885-6091.



cies and wham! Uniden's out with new phones that use them.

Uniden definitely leads the way with their release of eleven 25-channel cordless phones. Ranging in price from \$109.95 to \$299.95, these units should be in stores well in advance of the Christmas selling season. The first models introduced—the XC3510, XC3510G, XC3514, and XC3515—feature true compander circuitry, 25-channel autoscan and one-touch memory dialing.

Also included in the 25-channel line-up are three high-security models equipped with voice scrambling. The DX4519, DX4534, and DX3555 not only feature scrambling, but have dual keypads and speakerphones. Also available will be three digital cordless answering systems. Look for the new phones soon at a dealer near you, or contact Uniden American Corporation, 4700 Amon Carter Blvd, Ft. Worth, Texas 76155.

Keeping Dry

You've hit the beach and are ready to slip on your snorkel, but you don't want to leave your scanner or shortwave radio on the beach. And you certainly don't want them to get water logged. What do you do? You get Magellan's Water Pocket, a leak-proof waist bag that keeps water out down to 130 feet. It's \$11.85 plus shipping or \$15.85 plus shipping for the larger (6 x 9") Watch Pouch. For more information, a catalog, or to order, contact Magellan's, Box 5485, Santa Barbara, CA 93150-5485 or toll-free 800-962-4943.



Wireless E-Mail

PageNet and the CompuServe Information Service have formed an alliance to develop wireless E-mail services. Called "Stay in Charge," the new service will allow CompuServe members to have their E-mail forwarded to their pagers and allow them to be alerted via pager whenever mail arrives in their CompuServe mailbox. Members will also be able to send E-mail directly to the PageNet alphanumeric pagers of fellow members.

"CompuServe and PageNet are both dedicated to serving the needs of the mobile professional, and this relationship creates a synergy that will be beneficial to both companies and their customers," said Douglas Ritter, vice president of new business development for PageNet.

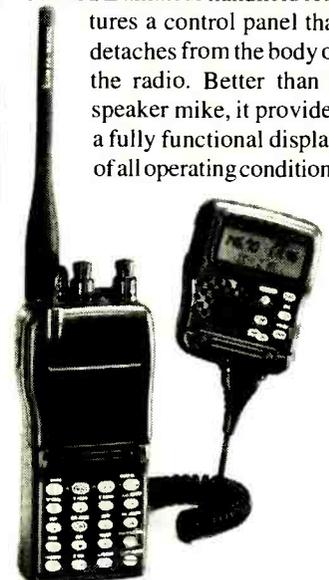
For a free introductory CompuServe membership, call 800-524-3388 and ask for representative 664. For information

on PageNet, E-mail scott_baradell@pagenet.com.

ICOM Dual Band Handheld

Talk about breaking new ground ... ICOM's just-released IC-Z1A/E amateur handheld fea-

tures a control panel that detaches from the body of the radio. Better than a speaker mike, it provides a fully functional display of all operating conditions



(including band and frequencies) and complete control of volume, modes, tuning, scan, band selection, ON/OFF and PTT.

An alligator clip allows the panel to be attached to your belt or purse, or be positioned where you can see it in a vehicle. The IC-Z1A/E also has alphanumeric memory display, DTMF, independent tuning knobs, and a power saver function. The unit operates in the 2m and 70cm bands.

For more information contact ICOM America, Inc., 2380 116th Avenue N.E., Bellevue, WA 98004 or call 206-454-8155.



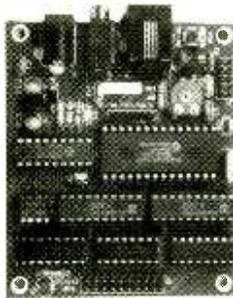
ICOM All-Mode Transceiver

ICOM continues to make history. In addition to the handheld with detachable control panel mentioned above, ICOM has announced the IC-706—an HF/VHF all mode transceiver. Billed as the smallest in its class in the world, the IC-706 covers all ham bands to VHF in all modes including RTTY. Oh, by the way, it has a detachable front panel, too!

Designed to be used anywhere—base, mobile or portable—the unit features IF shift, CW reverse, CW pitch control for HF, and all modes from SSB, CW, RTTY, AM and FM in all bands.

Wondering about band conditions? Check HF or locate vacant VHF frequencies with ICOM's spectrum scope function, allowing you to scan between two programming frequencies and plot the received signal strength on the function display.

For more information on availability and price, contact ICOM America, Inc., 2380 116th Avenue N.E., Bellevue, WA 98004 or call them at 206-454-8155.



Auto-Kall

MoTron has introduced a neat little gizmo called the Auto Kall AK-16. The newest of the product line, the unit is a DTMF controller that allows the user to activate lights, appliances, gates, and other electronics around the home from a handheld or mobile radio.

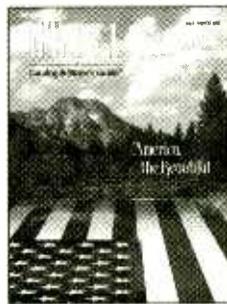
The possibilities for this are endless, including remote operation of a video camera, right down to pan, tilt, focus, and zoom functions. The AK-16 can be configured with a Morse Code response that lets you know that the commands have been carried out, or to let you know what devices are on or off.

The DTMF controller comes with 16 relay driver outputs, DTMF to X-10 home control, 32-character CW ID, Morse response tones, 0-12 digit security code, and serial output to convert incoming DTMF to ASCII for computer input. The unit sells as a fully assembled circuit board for \$99.00. For more information or to order call Motron Electronics at 800-338-9058 or write them at P.O. Box 2748, Eugene, Oregon 97402

Code Learning Software

An already-successful Morse code training program has now been upgraded to CODE MASTER V. The new version can be modified to include foreign characters or procedural signals; it also generates trial exams, sample texts, emulates "hand keying," and features an arcade-style game

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to make learning more entertaining.

Operations Manager Marshall Emm says, "To the best of my knowledge we are the only publisher of Morse software prepared to guarantee actual results—0 to 20 WPM in 90 days!"

Codemaster V is priced at \$24.95 with an upgrade price of \$12.50 for existing users. Call 800-238-8205 to order, or for info on the program or Milestone's other products, write to Marshall Emm at Milestone Technologies, 3140 S. Peoria St, Unit K-156, Aurora, CO 80014-3155; (303) 752-3382.

DSP Technology from ICOM

ICOM America has introduced two units featuring Digital Signal Processors. The IC-775DSP HF transceiver and the IC-775 both decrease noise components by digitally separating the desired signal from the noise before it enters the audio amplifier. The result is an outstanding signal-to-noise ratio.

A newly developed, 90 degree phase shifter and digital PSN

(Phase Shift Network) reproduce clear transmission and reception in SSB through carrier suppression and unwanted sideband rejection. A digital AF automatic notch attenuates signal tone signals, such as beat signals or broadcast station interference. An 80Hz ultra-narrow CW filter cuts adjacent interference, while twin Passband Tuning electronically narrows the receiver IF passband and shifts the center frequencies of the IF filter to clear reception during crowded band conditions.

Communicating was never so easy. For further details and pricing on the IC-775DSP and IC-775, contact ICOM America, Inc., 2380 116th Avenue N.E., Bellevue, WA 98004 or call them at 206-454-8155.

Broadcasting Catalog

Interested in broadcasting? Want a free catalog of professional-level broadcast books? Call Focal Press at 1-800-366-BOOK and ask for the Electronic Media catalog, item Code #520. Most of Focal Press' titles on broadcasting are pretty good, and at any rate, at this price, you can't go wrong. Mention *MT* when you call.



Message Tracker

By John P. Seibels

Note: The Electronic Communications Privacy Act of 1986 makes illegal the surreptitious monitoring of pager communications not intended for you.

Until now, the ability to view digital pager messages has until now required the use of an expensive piece of hardware such as the Universal M8000, or M4000 decoder, costing hundreds of dollars. Recently, however, K&L Technology has entered the market with a new product called Message Tracker at the affordable price of \$99.95, placing it within the budget of most hobbyists.

Simple to install and operate, the device consists of an adaptor that plugs into the RS-232 COM port of your computer, an audio cable for the headphone jack of a scanner, and a DOS installation disk. An easy-to-understand owners manual will soon have you displaying messages on-screen, complete with time stamp and pager capcode.

Message Tracker can decode all baud rates of both the GOLAY and POCSAG pager formats. By pressing the F1 key, a control option screen pops up allowing the user to select the various features available to customize his signal reception. For instance, he can select individual baud rates to monitor, or simply select the autobaud feature which permits automatic switching between all paging speeds in use. Either numeric or alphabetical (text) messages may be selected for display, or by choosing both, the user can see everything broadcast on the channel.

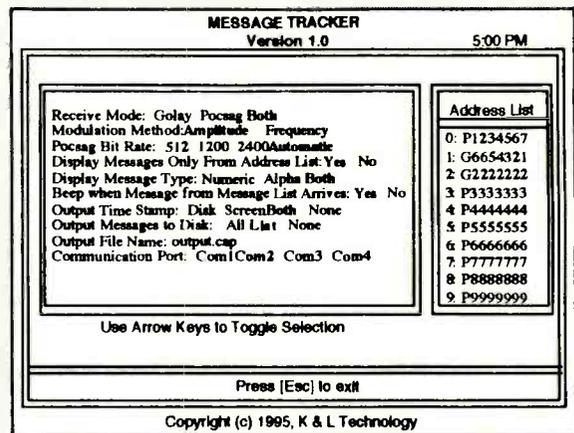
A user list allows up to ten pager capcodes to be entered and, if selected, only pages from that user list will be displayed along with a "beep tone" to alert you that a targeted pager number has been sent a message. Toggling off the user list off displays all transmitted messages, which is, of course, necessary if you are using Message Tracker as a testing tool for your paging system.

The message tracker display consists of a 120-line, circular buffer which scrolls up the screen and allows you to read previous messages while still receiving new ones into the buffer. For unattended operation, messages can be stored to disk in a file by selecting that option from the control screen. A file thus created can then be edited or printed using a standard text editor.

Initial installation and testing at my location went smoothly, and although it is recommended that you use at least a 386 computer with a math co-processor, the lack of the latter proved no hindrance as messages from a nationwide paging service flowed up the screen faster than the eye could follow! The only hardware adjustment that the user is required to make is to correctly set the scanner's volume, using lightup indicators on the screen to show the presence of audio, and the receipt of data. This process was both simple and non-critical.

As messages are received the screen informs you as to the baud rate in use, and an error box flashes to alert you if any errors are detected in the data stream. Strong paging signals (aren't they all?) provided error-free message display in all cases from some 30 or more paging transmitters operating in my area.

Even if you live in a rural area you are sure to be able to receive at least some paging signals. Nationwide paging services blanket the countryside with high-powered transmitters that operate simul-



taneously and receive their data from satellites overhead. This means that a page, no matter where it originates, is available anywhere and everywhere across the nation. This keeps the channels extremely busy because the tens of thousands of subscribers are having their messages distributed by many hundreds of transmitters, all at once.

Who uses these services? Well, of course doctors and salesmen do, but also federal and local law enforcement personnel, escort services, movie execs, drug dealers, emergency medical technicians, limousine drivers, and even spies. Even as a method of recording and time stamping one's own pages and saving them to file, Message Tracker is a great little tool.

Message Tracker is available for \$99.95 plus \$4.00 shipping and handling from K&L Technology, P.O. Box 460838, Garland, TX 75046-0838. Phone or Fax (214) 414-7198.

ZSRS Wideband Receiving Antenna

by Bob Grove

We recently came across a dandy HF vertical for base or portable receiving installations. It will be of special interest to our non-U.S. listeners because of its sourcing.

Manufactured in South Africa, the ZSRX is a receive-only vertical antenna for continuous 50 kHz-30 MHz coverage. A spinoff of the ZS dielectric antenna, the sturdy unit is professionally made of heavy-gauge aluminum tubing. It is affixed with a standard SO-239 coax fitting.

Measuring an overall height of 18 feet, the antenna comes equipped with heavy-duty mounting plates and U-bolt hardware. The vertical section is constructed of alochrome-finished aluminum tubing. Cost is approximately \$92 plus shipping.

We have one of these lightweight, but sturdy, antennas on our offices, and shortwave reception is excellent. For further information or for ordering, contact the manufacturer direct: ZS Electronics (PTY) Ltd., PO Box 1577, Randburg, South Africa 2125; phone (+27) 793-1050 or fax (+27) 792-4428.

The Radio Shack PRO-2037 Desktop Scanner

Since 1989, Radio Shack has offered a 200-channel, base scanner with 800 MHz coverage, manufactured by General Research Electronics (GRE). Each new model offered about the same features with minor changes and was priced in the \$300 - \$350 price range.

The PRO-2022, available from 1989 through 1993, scanned slowly and was rife with cellular phone image interference in the 850 MHz band. I use a modified PRO-2022 in remote, 24 hour a day operation, rebroadcasting whatever it hears through a baby monitor repeater.

Radio Shack replaced the PRO-2022 in 1993 with the PRO-2032. It scanned and searched faster, but wasn't much different from the previous model.

The PRO-2037 is the latest model in the succession and has new triple-up conversion circuitry, entirely plastic construction, and an AM/FM mode key replacing the speed key in earlier models. Like the older models, the 200 channel PRO-2037 is manufactured by GRE and lists for about \$300.

You could also view the PRO-2037 as being the base version of the portable PRO-62, reviewed in February. Both models have the same memory organization, the same IF (intermediate frequency) scheme, both use triple conversion circuitry, and both tune: 30 - 54 MHz (5 kHz steps) 118 - 136.9875 MHz (25 kHz steps) 137 - 174 MHz (5 kHz steps) 380 - 512 MHz (12.5 kHz steps) 806 - 823.9875 MHz (12.5 kHz steps) 849.0125 - 868.9875 MHz (12.5 kHz steps) 894.0125 - 960.0 MHz (12.5 kHz steps)

If you want to scan military air, 220 MHz or 28 MHz ham band coverage, the PRO-2037 is not for you.

The PRO-2037's 200 channels are divided into 10 banks of 20 channels each—a good arrangement. As in the PRO-2035 reviewed last January, a lithium battery is soldered to the main circuit board and preserves memory in the event of a power failure. The owner's manual states that memory will be retained for 1 miserly hour—totally inadequate for a 200-channel scanner. Suspecting a misprint, we unplugged our PRO-2037 for three days and the memory contents were retained without problem.

Individual lockout and two-second rescan



delay may be selected for each of the memory channels, but time is wasted scanning empty channels unless they are locked out. Users may choose between AM and narrow band FM modes on any frequency. The PRO-2037 has but one pair of search limits, and the step sizes are factory set. Frequencies cannot be locked out during a search as they can in some of the Uniden/Bearcat models.

The up and down arrow keys allow direct searching starting with the currently displayed frequency. Frequencies found during a limit or direct search can be stored in 10 monitor channels—a feature familiar to Radio Shack scanner customers.

The Hyperscan™ feature allows the PRO-2037 to scan at 25 channels per second and search at 50 steps per second—quite a bit slower than Uniden Turbo Scan models. When enabled, the priority channel is checked every two seconds. As in the PRO-62, any channel may be designated as the priority channel, but there is only one priority channel.

A user can reset the microprocessor or perform a full scale initialization, which clears all memories, by actuating a pushbutton accessible through a hole in the back of the case.

■ Physical

PRO-2037 construction differs from the PRO-2022, PRO-2006, and earlier models as there is no metal frame. The main circuit board is sandwiched between the top and bottom halves of a plastic cabinet. Also, the back of the PRO-2037 is entirely plastic. It is half the weight of a PRO-2006 and is so lightweight, we had to open it to make sure there wasn't a small PRO-62 printed circuit board hidden inside!

The PRO-2037's RF circuitry is contained on a main printed circuit board, and a separate board is used for the keypad and display logic. Unlike the Uniden/Bearcat BC860XLT, which

uses an external wall transformer, the PRO-2037's power transformer is screwed to the inside of the plastic cabinet, and an AC power cord is permanently affixed. The PRO-2037 can be powered from an external 13 VDC source using an optional cord and plug.

■ Fair RF Performance

We used a PRO-2037 with serial number 002193 for this review and compared it with a classic PRO-2006 using an outdoor Antenna Specialists AV-801 antenna. The PRO-2037 was more sensitive in the commercial aircraft band and slightly more sensitive in the 2 meter ham band. Both scanners were equally sensitive in the 460 and 855 MHz ranges. There was a much larger difference in image and intermod performance—a contest won easily by the discontinued PRO-2006.

The PRO-2037 IF lineup is: 257.5 MHz, 21.4 MHz, and 455 kHz. The use of up-conversion (a high frequency for the first IF), should help reduce image reception because the image frequency is moved much further away from the desired signal. Sad to say, the inadequate front end filtering still allowed images to be heard on our PRO-2037, but on different frequencies than with scanners using a 10.7 or 10.8 MHz first IF.

Strong signals in the 904 - 932 MHz range were heard when the PRO-2037 was tuned 515 MHz lower—twice the frequency of the first IF. Automatic Vehicle Locating (AVL) transmissions on 904.05 MHz were monitored on 389.05 MHz. Several paging transmitters in the 931 MHz range wiped out reception of federal government stations near 416 MHz on two PRO-2037s.

Our PRO-2037 heard a strong 95.9 MHz FM commercial broadcast transmitter on 138.7 MHz, which is 42.8 MHz higher and twice the 2nd IF. Railfans take note—paging appeared on frequencies in the 160 - 162 MHz range. On two PRO-2037s, 162.55 MHz NOAA weather transmissions were heard on 161.19 MHz. A 163.25 MHz paging transmitter was monitored on the same frequency.

A 158.7 MHz paging transmitter interfered with ham reception on 147.3 MHz, a popular repeater frequency, and on 149.46 MHz, too.

The squelch worked well and had the proper

Radio Shack Specifications Published for Typical PRO-2037

Sensitivity—FM (20 dB (S+N)/N at 3 kHz deviation):

- 1 μV through 512 MHz
- 2 μV 806 MHz and above

Sensitivity—AM (20 dB (S+N)/N at 60% modulation):

- 2 μV through 512 MHz
- 4 μV 806 MHz and above

Spurious Rejection—FM (at 154 MHz): 40 dB

Selectivity:

- + or - 10 kHz at -6 dB
- + or - 20 kHz at -50 dB

IF Interference Ratio:

- 257.5 MHz at 154 MHz: 50 dB
- 21.4 MHz at 154 MHz: 100 dB

Scanning rate: 25 channels/sec.

Search rate: 50 steps/sec.

Priority sampling: 2 sec.

Delay time: 2 sec.

Squelch sensitivity:

- Threshold: less than 1.0 μV
- Tight - FM: (S+N)/N 25 dB
- Tight - AM: (S+N)/N 20 dB

Antenna impedance: 50 ohms

Audio Power (10% THD): 1 W, nominal

Built-in speaker: 3", 8 ohm, dynamic type

Power requirements:

- AC: 120 volts, 60 Hz, 13 watts
- DC: 13.8 volts, 8 watts

Operating Temperature:

- +32 degrees F to +109 degrees F

Dimensions (inches):

- 3-1/4 x 8-7/16 x 6-13/16 (HWD)

Weight (without antenna):

- Approx. 38.7 oz.

amount of hysteresis. The audio quality was good, and more crisp and clear than the PRO-2006. The PRO-2037 lacks the TAPE jack found in the PRO-2006 and Uniden/Bearcat BC9000XLT.

The PRO-2037 still sports a 1/8" monaural headphone jack on the front panel, an anachronism in the 1990s when lightweight stereo headphones must be a thousand times more common than mono phones.

■ **Keyboard and Display**

The keypad consists of 24 small rubber keys, all round and gray. As with most GRE-made scanners, the keypad seems designed for ease of manufacture, not ease of use.

The LCD (liquid crystal) display is legible—backlit by light-emitting diodes and colored green as in the PRO-2035.

■ **Summary**

The PRO-2037 is a fairly good performer with basic, ho-hum features but is overpriced at \$300. It has good audio and a usable bank size, but weak front end filtering erodes the potential image rejection advantage expected from using up conversion.

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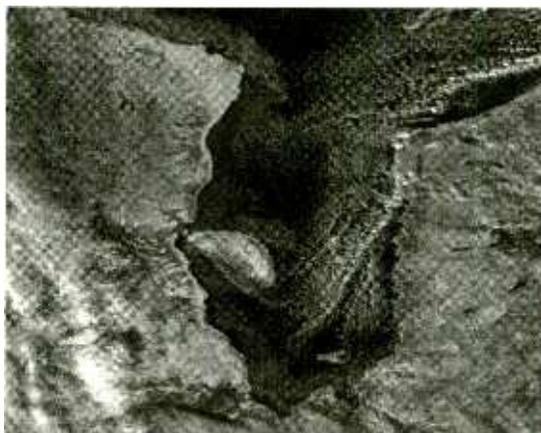
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But what if you spend as much on a radio as you would, say, on a world cruise or small car? In the past, we've tested some professional-grade receivers from Racal and Watkins-Johnson, and found that you're usually better off with a \$1,000 tabletop model designed for shortwave listening and DXing than you are with a fancy professional model.

■ Different type of professional receiver

But there's a different type of professional-grade model worth looking into, the Japan Radio NRD-93. This one runs nearly \$10,000, and has been out for several years. When the last units are gone—which they already may be—it will mark another end to an era. Unlike the Watkins-Johnson and Racal offerings, the NRD-93 isn't aimed at the military-intelligence market. Instead, it has been designed specifically for use on the high seas, where salt air and the pounding of waves can do in even the toughest of normal receivers.

So, it's not surprising to find that the first requirement of a maritime receiver is to be tough and reliable. The Japan Radio NRD-93 is definitely this, but it goes well beyond mere toughness. It is actually a *crafted* receiver, one that brings to mind the Japanese tradition of technical perfection. With the '93, you notice this from the moment it is turned on. Digital information is displayed on easy-to-see red and green LEDs, which indoors are much kinder on the eyes than glary fluorescent displays or low-contrast LEDs.

■ Outstanding layout and "feel"

The radio is kind on the hands, too, which is no small matter if you're spending hours at a stretch cruising up and down the bands. Unlike most other receivers, the '93 has knobs that are well-spaced, with a silky, solid feel that brings back memories of the old tube-type National, Collins, and Hammarlund re-



What do you get when price is no object? You get a receiver that keeps going and going ... Though the NRD-93s are no longer being manufactured, they should be in circulation for a long time.

ceivers. Even if you have beefy fingers, this is a radio with tactile "feel good" that is absent on virtually all other modern receivers.

That same spirit is found inside the receiver, too. With most professional receivers, there's usually lots of empty space inside. So the usual response when someone first opens it up is a gasp, followed by, "Where's the radio?"

■ Self-repairable

When you look inside a '93, you know this is a *real* radio—the meaty, hands-on kind that Jackie Gleason used to insist upon when he was alive. Construction is modular, with a mother board and slide-in subsidiary boards. Yet, it takes only three minutes to disassemble. The radio even comes with its own repair kit and two boxes of spare parts so the operator can fix it himself. (*Herself?* Strictly speaking, sure, but the only people I know of who own a '93 are men. This piece of iron is really a guy's radio.)

So the '93 is a logical choice not only for the high seas, but also for those who live in isolated parts of the world. Like the BBC show, "Desert Island Disks," this is the ultimate "Desert Island Radio"...*provided* you can get electricity! In that regard, the '93 operates from 90-253 VAC, as well as outboard 24 VDC.

■ Toughest of the tough

How rugged is Japan Radio's '93? A retired seaman once told me that the ships he served on would go in and out of dry dock for repairs, but the Japan Radios on those same ships just keep humming right along for decades.

Not enough? *Passport to World Band Radio* has a Japan Radio NRD-515 at its listening post in a remote part of South America, well away from cities and electricity. One day, lightning hit the monitoring shack, blowing it and everything inside into splinters. But even though the radio's paint was burnt, it

functioned perfectly. That was years ago, and it's still working fine to this day.

Of course, having something that lasts longer than most marriages doesn't mean much if the radio handles awkwardly, or performs poorly. Fortunately, here the report card is largely excellent. The ergonomics, in particular, are simply first-rate. This is a radio designed to be used hour-after-hour, day-after-day, by the fussiest of professional operators.

Still, the physical feel of the radio is very much an individual-taste thing. With the ergonomically-challenged Drake R8, for example, we've had feedback from owners that range from "I don't see any problem" to screams of outrage. It's sort of like DOS people vs. GUI (Mac, Windows) people. Personally, I cheerfully gave up on DOS years ago, so there you have my bias.

■ Performance excellent, but not quite best

As to whether the '93 actually picks up more signals, or brings them in better, forget it. Certainly, anyone used to Japan Radio's consumer-grade radios, such as the NRD-525 and NRD-535, will be surprised to find that the '93 has audio quality that's downright pleasant. It's a big plus over the '535; but, frankly, you can get audio that's even better with the Drake R8 and Lowe HF-150, which are a tiny fraction of the '93's price. (Alternatively, Sherwood, Gilfer, and Lowe can modify the '535 to improve its audio.) In fact, those cheaper receivers come with audio-enhancing synchronous selectable sideband, which the '93 lacks.

There are only two voice bandwidths, too, which is kind of silly in a receiver of this price. Still, you can plug in additional mechanical filters to resolve this. And while the dynamic range/third-order intercept points are pretty much adequate, they're far from what they could have been. Of course, if you're thinking, "For ten kilobucks I shouldn't have to install my own filters, or have second-rate

dynamic range," you're right. But such is life, and in North America you should find the dynamic range to be sufficient, no matter what antenna you use.

Otherwise, the '93's performance is right up there with the very best. In IBS' lab tests, sensitivity, skirt selectivity, ultimate rejection, blocking, phase noise, image rejection, front-end selectivity, AGC threshold, and frequency stability are all excellent, or even superb. And after you've used the set for a couple of weeks, your ears will confirm what our lab equipment shows: The NRD-93 is one heck of a performer.

But, the rub is that you can say the same thing, or better, about the best of the tabletop receivers that sell for around \$1,000. So, why bother?

■ Why buy?

It appears to come down to a certain quality of inner satisfaction. Most things may work well when they're new, but they just don't last. The '93 is the high-water mark in quality for a modern electronic product. And it's a piece of craftsmanship. It looks like it, it feels like it—and will still look and feel like it beaucoup years from now.

I have a car like that—a Mercedes I bought used on the cheap when our VW bug was stolen. It ran fine for 20 years; then I did some major work on it so it could go for another 20 years. To this day, after almost a quarter century of use, it still doesn't have a rattle or squeak or leak or groan. Am I happy? You bet, but how many characters do you see driving around in cars that are almost as old as most people? Not many, and not many are going to spring for the likes of an NRD-93. But some do, probably putting them in their wills, along with the family jewels.

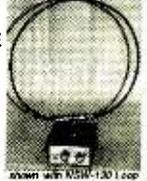
So, back to our question: What do you get if price is no object? With the NRD-93, it depends on whether your chief priority is in performance or quality of construction. \$1,000 tabletop receivers are usually designed for shortwave listening and DXing, whereas professional rigs typically aren't. So you pay lots more for this kind of receiver, but the end result may actually be less performance than with a cheaper alternative.

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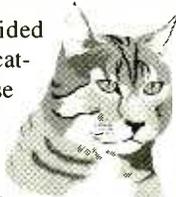
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How Many Products Can You Name "Cat"?

Well, since Computer Aided Technologies' new Copycat-Pro is now ready for release (see ads in *MT*), we can finish up our review of their product line starting with this new feline offspring.



We discussed the first version of Copycat in this column in August '94. In its initial form it was intended to be a TNC control program primarily for Universal (but also including AEA and MFJ) decoders. The idea was that Copycat would remove the need for memorizing all the crazy key combinations required to use these powerful decoders to their maximum potential. Most of these commands were on pulldown menus and simply required a click/keystroke to become available.

The main new feature of Copycat-Pro is what I would call a "mini-Scancat" program, enabling you to tune your computer-controlled receiver. How does it work? What does it look like? Will it be the big time or the litter box for this cat? Let's see.

■ Leashing Copycat

In order to use all the functions of Copycat-Pro you will require one of the many computer-controlled radios which the program supports (these include Yaesu, ICOM, Kenwood, AOR, Japan Radio, Drake, and Radio Shack scanners with OPTO boards), a receiver/computer interface if required by your radio, and a TNC. Copycat supports Universal M-7000/M8000, MFJ-1278, and AEA PK-232. For our discussions we will use an ICOM R-71A with an AEA PK-232MBX.

The installation of Copycat-Pro is quick and very simple. Just typing "install" will do it all. Once this is done about 700K of files are decompressed and will appear on your hard drive. The program comes with a manual that is flawless in giving the user all the details he/she needs to know and leads you through a number of tutorials. We will use a 486-33 DX2, 8 Meg RAM, bus mouse, two serial ports and SVGA.

I couldn't find any information about minimum computer system requirements, or operation from a floppy disk with the decompressed files. However, I discovered that Copycat will run on a laptop 386-16

SX, with 1 Meg RAM and an LCD screen. It will also run from a floppy disk, but be prepared for some "free time" during operations such as loading of the program and frequency files. This time is cut to seconds using it on a hard drive. Although by using the ALT key any function of the program can be accessed, I found it much simpler to use a mouse for command choices.

Once loaded, you will see the main screen with its titles of pulldown menus near the top. The major part of the screen is the area where decoded information from your TNC appears. At the bottom of the screen is current operational status information. Once you choose the setting for your actual equipment, they will appear at the very top of the screen. See Figure 1. It looked so similar to the original program that I first thought I had loaded the wrong version. But looking closely at the top right hand of Pro version's screen the title "Devices" appears. Clicking this title brings up a menu from which not only is the serial port parameters of your TNC set, but also your radio's serial parameters.

The TNC operation of Copycat-Pro has not changed significantly from our last review, so we will concentrate on the new radio-controlling features.

■ Riding the Copycat

First clicking on "Port" opens the serial ports to our TNC and receiver. We can manually send frequency and mode data to our receiver by typing "/F" and then the frequency in MHz, a space, and then the mode. For example, /F 6.4945 USB, will tune your receiver to a RTTY weather station on 6.4945 MHz. But this manual stuff is where I lost

interest with the original Copycat. The concept seemed to defeat the very reason for using a computer. Copycat-Pro changes that.

Clicking on the first menu title on the left, "Files," gives us the capability of accessing Scancat files via the "Load File" command. From here we can go into our Scancat directory, find a list of frequencies we are interested in—say, weather fax stations—and bring them into Copycat-Pro. Figure 2 displays the resulting file viewer screen. By using the arrow keys over the desired station and pressing Enter, our radio will be tuned to that frequency and mode. Further, if TNC decoding details were included in the station's info, the TNC would also be set. Pressing the escape key brings you back to the main screen and the output of your TNC.

Using the arrow keys you can quickly and easily run down and check all your loggings without having to manually input a thing. Now, that's the way computers should serve us! Pressing F3 brings the file viewer screen and your logging list back into view, so you can tune to a new station. The F2 key allows you to load a different logging file into Copycat.

Using Copycat-Pro is very easy. But one feature which is a hit or miss situation is text control of your TNC. When I used the pulldown menu to set the mode of my PK-232 I never had a problem. But when I tried to type in a mode command, or include one in a logging file, the TNC didn't always recognize the command. The manual provides a list of the valid Copycat mode commands, but before you can use them you must make sure your TNC understands them. For example, Copycat let me type in RTTY to get my PK-232 into the RTTY mode, but the PK-232 stayed in packet mode, because (as I eventually realized) it wants to hear the command "Baudot." Since Copycat already "knows" what TNC you are using, it could have a routine in it to either convert the RTTY command to Baudot, or a prompt could come up to say that this is not a valid PK-232 command. As it stands now, you are never quite sure what has, or has not, been accepted by the TNC.

It would also be useful if menu commands which are not supported by your TNC are not displayed. Currently

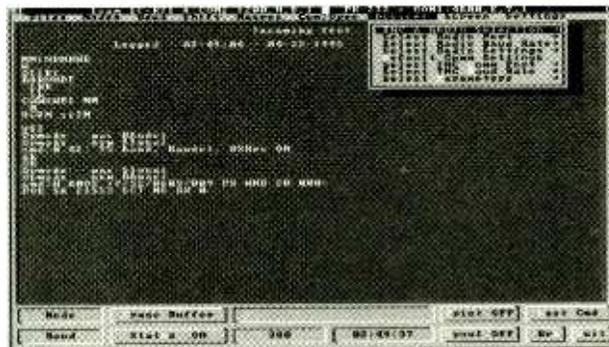


FIGURE 1: Main Copycat Pro Screen.

it's "try it and see if anything happens." These situations arise due to the program's praise-worthy and high degree of equipment flexibility.

■ The copyCATS Meow?!

I liked the program. For me, the Pro version is really the only version I would consider due to the great reduction in manual inputting of data. The program is a DOS based program, but will operate under Windows 3.1 (in contrast to AEA's Packratt for Windows TNC controller program, which only runs AEA TNCs). For flexibility of TNC and receiver types, Copycat gets high marks. But as we said, the flexibility is at a price: Copycat-Pro is priced at \$79.95, while Copycat version 2.1 sells at \$59.95. Version 2.1 is essentially Pro without the radio control capability. An upgrade from all versions of Copycat to the Pro is available at \$24.95.

■ The Cat's International Family

Although not in keeping with their CAT titled products, Hoka Code 3 is also distributed by the company. Made in The Netherlands, Computer Aided Technologies has added a much needed "real person" technical assistance to Hoka users. In addition, they have produced a new manual for the Code 3 which I found much better organized and readable. We have previously addressed Code 3 in this column (Nov 94). Over the past months my use of the Code 3 has reconfirmed my conclusions in that review: There are cheaper decoders and there are more expensive data analysis tools. But Hoka falls in a category between them.

■ Hoka Reflections

No other product under \$1200 has all the decoding modes, analysis screens, or data form storage capabilities similar to the Code 3. With *all* its decoding modules it comes in at \$750. We have already discussed the ever-increasing use of encrypted data which makes reading of the data impossible to any off-the-shelf decoder. However, for those among you for whom analysis and cataloging data signals is your thing, Code 3 is for you.

One of the new features included in the total module is a new Synop plain language module. Synop is a form of weather reporting that dates back to the time when letters slowly clattered out on mechanical teletype machines. To decrease the amount of time required to send all the forecasts and observations, a

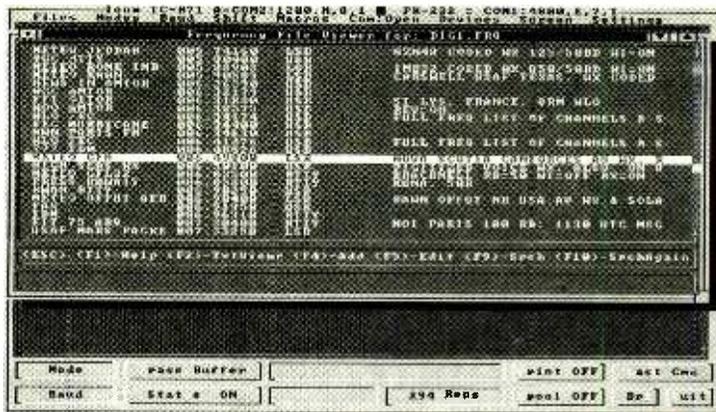


FIGURE 2: Copycat Pro's Fileview

complex language of abbreviations, Synop, was adopted by the world's aviation community. Being able to translate this mess of letters was the worst part of getting my pilot's license many years ago. Well, the Code 3 now has a module that does the translation for you—or almost. It gets much of the data translation right once it hears a ZCZC and the meteo code form. This can take many tens of minutes before a station sends this header data. When it does lock onto a European meteo, clear language weather reports come streaming out.

The program had a bit of trouble decoding the observing station's identity when decoding KAWN meteo data. This could be because the program is looking for a four-letter identifier code. KAWN, being in the USA and sending observations from US stations, usually drops the country-identifier, just sending three letters. For example, Little Rock Air Force Base, whose meteo ID is KLRF, becomes just LRF when used by the KAWN meteo. If this non-standard format is creating the problem, it should do fine on European meteos, such as Bracknell, UK. So let's just pull up Bracknell's station data...Uh oh...

■ Déjà Vu

Because of Code 3's analysis power it pretty much takes over your PC leaving little

room for "other things". Like what other things? How about changing to other stations, for example? To go from KWAN meteo to Bracknell requires manual look-up, pencil and paper, and then receiver tuning! I repeat my original comment on the old Copycat, "Is this any way to run a computer?" Not in 1995. If Code 3 was accessible from within CAT's Scancat, or even a stripped down Scancat

shell, that would make it an exceptional monitoring tool, as well as the exceptional analysis tool that the Code 3 is today. I'm sure we have not heard the last "purr" on this possibility.

Computer Aided Technologies' stable of Cats is pretty impressive. These guys have been with it from the beginning of my total monitoring environment campaign, many years ago. CAT has continued to "push the performance envelope" of their products. Check out their ads in *MT* for their latest products, which includes their Cat's Whisker, telescoping and rotating portable scanner antenna. Or contact them at P.O. Box 18292, Shreveport, LA 71138, telephone (318) 687-2555.

■ Coming Attractions

Holy software! New programs are hitting the market at a new, all-time high rate. New ones on CD ROM including Map'n'Go and the new versions of QRZ and Chestnut's Hamradio. From the Grove catalog we have: Super DX Edge, SatellitePro, Scan Star Pro and Tune-in. AEA's new Fax III is pretty nifty. And RCSI's ScannerWear and a hot new program from the people who brought you SWL Manager are in the wings. I feel it's my duty to start trying them out right now. It's also a great excuse for not doing the lawn.

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Still Looking for Parts?

There is a plethora of surplus electronics components dealers across the USA today. Yet, we authors receive many letters from readers who say they can't find some of the parts for a particular construction project. This subject has been treated previously in *MT*, but I want to cover it again in order to update the supplier lists and to reach you new subscribers who may have missed the June '94 article.

Common reader comments are, "It's impossible to find parts," or "The price for parts is too high for my budget." It's logical to conclude that these comments are voiced by persons who aren't aware of the vast mail order parts market just awaiting plucking by workbench tinkerers like us. Others who voice complaints along the same lines are often unwilling to scan the magazine ads, jot down the addresses of suppliers, then order vendors' catalogs.

From my point of view there is nothing more comforting and useful than a large stack of parts catalogs. If I can't find a particular component in one of them, I usually locate it in another of the catalogs. I also do price checking in the catalogs. This ensures that I buy my components with the smallest cash outlay.

■ Innovation Helps, Too

Some types of parts can be made at home from ordinary materials. Innovation was an exciting challenge for experimenters and radio amateurs a few decades ago, but the tidal wave of imported electronics products seems to have turned the majority of would-be experimenters away from the do-it-yourself joys that once prevailed. Chassis, cabinets and panels can be fashioned from aluminum cookie sheets, for example. Masonite is also suitable for creating project foundations and boxes. The same is true of PC-board material, or even plywood.

Contact paper or paint can be used to impart a commercial look to these projects. Quality labels can be generated with a computer. Figure 1 shows examples of some panel labels I made using a simple graphic box within the WordPerfect word processing program. I printed them out on plain paper and then transferred them to white poster board by means of a copy machine. The labels are cut out and glued to the equipment panel

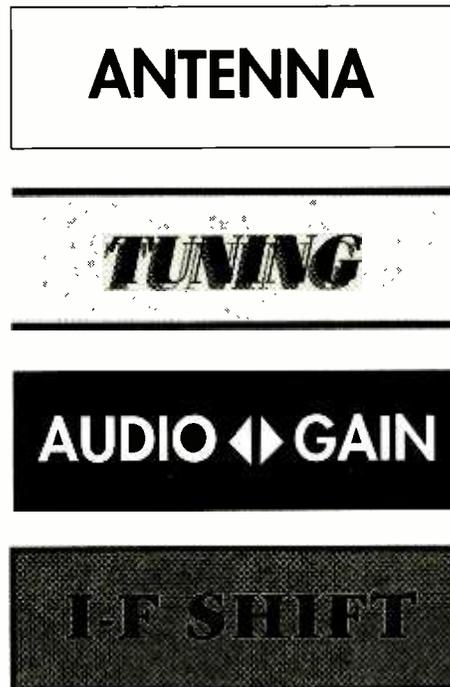


FIGURE 1: Examples of panel labels generated via DOS and WordPerfect with an IBM-compatible PC. Figure boxes are used to contain the desired lettering (see text). Other word-processing software may also be used.

with contact cement. Clear Krylon spray is used to protect the labels.

Antenna hardware can be fashioned from a host of ordinary materials such as PVC pipe, hair curlers, plastic coat hangers, and scraps of sheet plastic. Plastic shower-curtain hooks are useful for anchoring coaxial cable to tree limbs and towers, and the list goes on. Antenna insulators can also be made from wooden dowel rod that has been boiled in canning wax for 30 minutes. Thus, an antenna project that might cost \$15 with commercial hardware could be realized for as little as \$1 when using home-made parts.

Going a step farther, you need not use stranded copper antenna wire. Any kind of wire—insulated or bare—is suitable for making wire antennas. Copper conductors are best, but steel wire is satisfactory if it is galvanized or plated with cadmium (to inhibit rusting). Wire size is unimportant, provided it has the strength to support itself in the presence of ice and wind.

■ Be a Parts Scrounger

You can develop a treasure trove of electronics parts by stripping junked entertainment electronics devices and microwave ovens. Landfills are loaded with such gadgets, or check your street on trash-pickup day! These sources can provide a wealth of capacitors, coil forms, potentiometers, resistors, switches, and transistors. Audio transformers, speakers, and low-voltage power transformers can be also be removed from radios, hi-fi gear, VCRs and TV sets. Many of these treasures are available for pennies at yard sales and flea markets. Keep a sharp eye peeled!

The plastic and metal cabinets from most of the foregoing items provide a wealth of stock for making panels and cabinets. The screws and nuts from these products can also be gleaned for future use.

■ Your Catalog Library

Many surplus parts vendors have 1-800 phone numbers that you can use when ordering parts or a catalog. Check such magazines as *MT*, *CQ*, *QST*, *Popular Communications* and *Amateur Radio Trader*¹ for ads from those companies that offer catalogs.

Many parts dealers also sell a variety of electronics kits. The advantage of kits is that all of the essential parts are supplied for one price. Although many kits are offered in bare-bones fashion—minus knobs and a cabinet—you can fabricate your own enclosure inexpensively, as discussed earlier.

You should be aware that unless you order parts from a given supplier within a year, your name may be removed from the catalog mailing list. However, you can usually obtain the latest catalog by phoning or writing to the supplier, if you are dropped from the list.

■ Raw Material Sources

Galvanized furnace-ducting steel is excellent stock for making chassis and boxes. Heating and plumbing shops usually have a



TABLE 1: PARTS SUPPLIERS

All Electronics Corp.
P.O. Box 567
14928 Oxnard St.
Van Nuys, CA 91408-0567
1-800-826-5432 (1, 3, 4, 5)

Cable X-Perts, Inc.
113 McHenry Rd., Suite 240
Buffalo Grove, IL 60089
1-800-828-3340 (2, 3, 5)

Communications Concepts, Inc.
508 Millstone Drive
Beavercreek, OH 45434-5840
(513) 426-8600 (4)

The Coax Connection
105226 Meadow Lane
Naperville, IL 60564
(708) 420-0342 (2, 3, 5)

Dan's Small Parts & Kits
1935 South 3rd, West #1
Missoula, MT 59801 (1, 4)

Hosfelt Electronics, Inc.
2700 Sunset Blvd.
Stuebenville, OH 43952-1158
1-800-524-6464 (1, 2, 3, 5, 6, 8)

Marlin P. Jones & Assoc., Inc.
P.O. Box 12685
Lake Park, FL 33403-0685
(408) 848-8236 (1, 2, 3, 5, 6)

Mouser Electronics
2401 Hwy. 287 N.
Mansfield, TX 76063-4827
1-800-346-6873 (1, 2, 3, 5, 6)

MXM Industries
Route 1, Box 156C
Smithville, TX 78957
(512) 237-3906 (4)

Oak Hills Research
20879 Madison Street
Big Rapids, MI 49307
1-800-842-3748 (1, 4)

Ocean State Electronics
P.O. Box 1458
6 Industrial Drive
Westerly, RI 02891
1-800-866-6626 (1, 3, 4, 5, 6)

Ramsey Electronics, Inc.
793 Canning Parkway
Victor, NY 14564
(716) 924-4560 (4)

SESCOM, Inc.
2100 Ward Drive
Henderson, NV 89015-2749
1-800-634-3457 (5, 6, 8)

Small Parts, Inc.
6891 N. E. Third Ave.
P.O. Box 381966
Miami, FL 33238-1966
(305) 751-0856 (5, 7)

The 1-800 phone numbers in this table are for use only when ordering a catalog or parts. Number coding has been added in parenthesis after the phone numbers to indicate the type of merchandise offered by the vendors. 1 = small electronics components. 2 = coaxial cable and antenna hardware. 3 = assorted wire types. 4 = kits. 5 = electronics hardware. 6 = tools. 7 = tubing, sheet metal and plastics. 8 = cabinets, panels, and chassis. Catalogs are available from the above dealers.

supply of scrap material that you can buy at low cost, or the boss may simply say "help yourself." You may be able to buy old printing plates from your newspaper publisher, and these can be used for various workshop projects.

The local warehouse offices of industrial plastics companies often have odd-lot and scrap pieces of plastic rods and sheeting at very low prices. Check those sources for antenna hardware stock, in particular.

Also telephone and power companies often have leftover lengths of wire that are too short for their use. I have obtained wire from these entities at no cost a number of times. Likewise for magnet wire scraps that I have gotten from motor rewinding shops.

In Conclusion

Table 1 lists many suppliers of electronics parts. Code numbers have been added to indicate the types of materials they stock. The list is by no means complete. Rather, it represents those vendors with whom I traditionally do business.

I cannot strongly enough encourage you to try your hand at building some goodies for use in your radio room. Nailing down those elusive DX signals is only a part of our pursuit: Using home-built gear to do it represents "the rest of the story," if I may quote Paul Harvey of radio fame.

Note 1—Amateur Radio Trader, P.O. Box 3729, Crossville, TN 3857. Phone 1-800-774-2623 for subscription.

NOTE ON ADVERTISEMENT BELOW:

As of 4/26/94 it became unlawful to market cellular-capable receivers in the U.S. Atlantic Ham Radio assures us it will give a full refund and hold customers harmless from shipping expenses if a purchased unit is returned to the vendor by U.S. Customs.

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Yupiteru MVT7100, 7000,
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\$39
CD-ROM



AmSoft 717-938-8249

Moltron

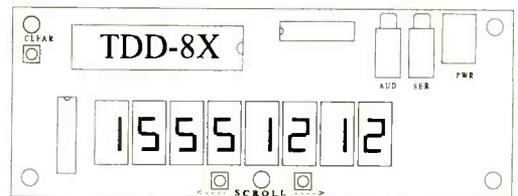
310 Garfield St Suite 4
PO Box 2748
Eugene, Oregon 97402

New Low Price!

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DTMF Decoder

The TDD-8X features a large 8-digit LED display and decodes all 16 DTMF digits. The 104 character memory is viewed, without loss of data, by scrolling either left



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Info: (503) 687-2118

Orders: (800) 338-9058

Fax: (503) 687-2492

Enhanced Zeromatic Mod

Before we get into this month's modification, I have an update to the May article concerning datalogging and Radio Shack's PC Interface multimeters. The 1995 incarnation of the meter (#22-168) is considerably improved over the 1994 version (#22-182). It has a much larger display; a frequency counter with extended range to 20 MHz; and a corner area of the main display serves as a second data display. For instance, the main display can show the RMS AC voltage of an audio signal while the second display shows the frequency of the signal!

The greatest improvement, however, is not in the meter. Rather, it's the new software: highly evolved and enhanced for the casual hobbyist as well as the salty old pro. Two versions of software are included with the 1995 PC Interface meter, one for MS-DOS and one for Windows. Both are very powerful, but the Windows version, called ScopeView, is absolutely breathtaking. Not only is there a comprehensive datalogging feature, but there is also a graphical plotter that sets up and displays exactly like an oscilloscope.

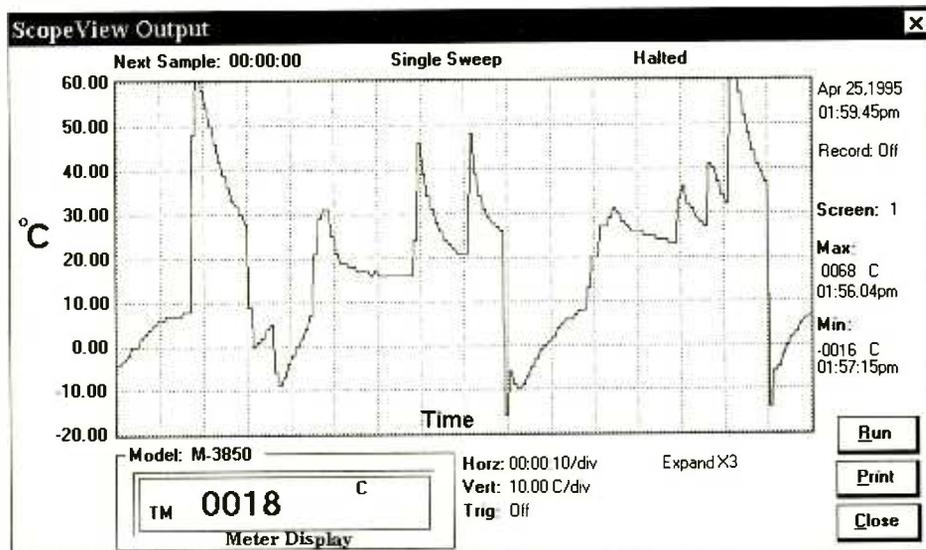
Furthermore, the graphic portrayal of the data is printable. Figure 1 is a real printout of a series of temperature measurements I made over a period of 160-seconds. The horizontal scale is 10-sec per division while the vertical scale is temperature, ranging from -20°C to +60°C. Temperatures were artificially varied with freeze spray and a flame in order to depict the ability of ScopeView to graphically record the meter's display. Impressive, huh? (Parameters of the display—range, value, and time units—are easily selected from a preliminary setup screen.)

Other PC Interface Meters

But, just when I thought the new Radio Shack PC Interface meter was the greatest, (and believe me, it's nice), I discovered the Metex line of interfaceable multimeters. Some of these offer an even greater variety of features and improved performance though they look just like the Radio Shack meter. And no wonder—Metex of Korea is the manufacturer of both. What's more: the US distributor I found turns out to be the same company that authored the fabulous ScopeView program that accompanies both the Radio Shack and Metex meters.

One look convinced me to acquire the Metex M-3850—a highly upgraded version of the

FIGURE 1: SCOPEVIEW PRINTOUT



1995 Radio Shack meter with additional features such as auto-ranging scales, 40 MHz frequency counter; internal and external thermocouple temperature inputs, and a logic function. A Type-K thermocouple is provided for accurate temperature measurements from -40°C to over 1200°C. This alone is a powerful feature.

For more information on the price-competi-

tive Metex PC Interface multimeters and the ScopeView program, contact AGA Associates, PO Box 99573, Seattle, WA 98199-0573, or fax: (206) 217-9138. A closing note: The ScopeView software is backwards compatible with Radio Shack's 1994 meter, #22-182. I'm not sure how it can be acquired for the older meters, but contact Radio Shack or AGA Associates for more information.

Enhanced "Zeromatic" for the PRO-2004/5/6

Note: The term "Zeromatic" is probably a trademark of the Tandy Corporation.

The venerable PRO-2004/5/6 scanners have a wicked feature called "Zeromatic" that serves to keep the scanner from prematurely stopping off-frequency from signals encountered in the SEARCH mode. Did you ever stop to wonder how a scanner is to know when it has reached exact center frequency of a signal? The operation and logic of the Zeromatic circuit are fairly complicated and we won't go into them here, but the results are very effective and impressive. When the PRO-2004/5/6 scanners stop on a searched frequency, you can be sure it is center frequency.

Unfortunately, the Zeromatic function is turned off in the MANUAL and SCAN modes, and I suppose the designers never had a thought

that it could still be useful in other modes. After all, MANUAL and SCAN frequencies are hand-programmed and memory-based, and if they're off-frequency, it's only because you entered them that way. So why in the world would you want Zeromatic for MANUAL and SCAN?

The answer, thanks to some ingenious work by Gregory K. Doerschler of Worcester, MA, is that it can prevent undesired adjacent channel (off-frequency) signals from breaking the squelch when you're monitoring desired channels in the MANUAL or SCAN modes. Suppose you are interested in 158.970 MHz and either have it in the MANUAL mode or are scanning up on it just as a powerful pager fires up on 158.960 MHz. The scanner stops and blares out a cacophony of raw noise. Your spouse threatens you with loss of a limb if you

don't turn the volume down.

Implementing Zeromatic for the MANUAL and SCAN modes will prevent splatter and other adjacent channel signals from breaking the squelch, and yet desired signals are not affected in the slightest. It's an easy modification that should be within the capability of most experimenters.

■ The Parts

SPDT Switch, RS# 275-635 or equiv
Resistor, 10-k Ω , 1/4-watt, RS #271-1335 or equiv

■ The Work

Refer to Figure 2 for visual guidance. For those who read words better than pictures, first identify the 15-wire bundle that goes between the main receiver board and the scanner's Logic/CPU Board.

For the PRO-2005/6, it's best identified as the 15-wire bundle that terminates at connector CN-3 on the main receiver board. The other end of this bundle is hardwired to the Logic/CPU Board.

For the PRO-2004, it's the 15-wire bundle that terminates at connector CN-504 on the Logic/CPU Board, the other end of which is hardwired to the main receiver board. For all three scanners, the 15-wire bundle is the only one of its kind in the scanner, so if you don't find 15 wires and pins, it's not the right bundle.

Next, identify the SEARCH control wire. For the PRO-2005/6, it's the brown wire that goes to CN3, Pin 6. For the PRO-2004, it's the wire (color uncertain) that goes to CN-504, Pin 10. In all cases, the connector pins are numbered on the printed circuit board with one end labeled "1" and the other end "15."

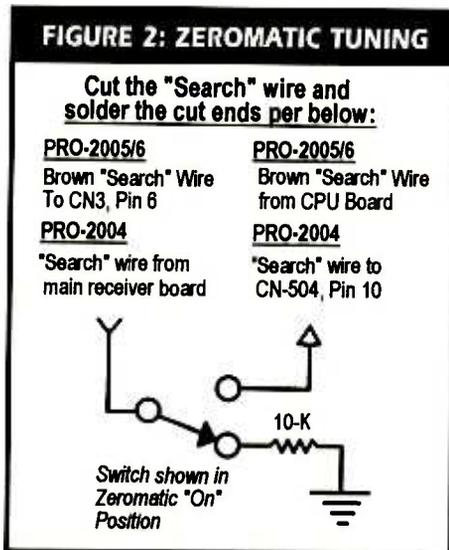
Cut the SEARCH control wire as identified above, preferably somewhere around the middle of the bundle, so the cut ends can be unraveled from the bundle and made convenient to handle. Strip a bit of the insulation from each cut end. Apply a dab of solder to each exposed end to keep the stranded wires from unraveling and to make it easier to perform the next step.

Install the SPDT switch at a location of choice on the scanner. The rear panel will be easiest and safest for most hackers. You decide. Solder the 10-k Ω resistor to *one end lug* of the SPDT switch. Solder the other end of this resistor to the chassis or a nearby ground trace on the PCB. Referring to Figure 2, solder one of the cut ends of the SEARCH wire to the *middle lug* of the SPDT switch as follows:

PRO-2005/6: the cut wire that goes directly to CN3, Pin 6.

PRO-2004: the cut wire that goes directly to the main receiver board.

NOTE: If the switch is located any distance from the cut SEARCH control wire, you'll



have to splice extension wires to the cut ends so they can reach the switch. Insulate the spliced joints with heat shrink tubing; not tape, for Pete's sake!

Lastly, solder the remaining cut end of the SEARCH wire to the other end lug of the SPDT switch. Wrap it up; work's done; time to party hearty! I told you it was easy.

■ Party Time

One position of the SPDT switch is "normal" operation, no change. The other position activates the "Zeromatic" function for the MANUAL and SCAN modes. The SEARCH mode is not affected. The result of this unique modification is reduced or eliminated "false" stops or squelch breaks from off-frequency signals and adjacent channel interference. SEARCH mode is not affected by this mod and there are no harmful side effects for the MANUAL and SCAN modes.

Note that Enhanced Zeromatic does not eliminate adjacent channel interference, nor affect the IF bandpass in any manner. It is simply an alteration of the logic from/to the scanner's CPU to prevent the squelch from breaking except when incoming signals agree with the frequency in the display. So long as squelch doesn't break, scanning or searching continues uninterrupted, and MANUAL mode just remains silent.

■ Other Scanners?

Well, maybe. Many Radio Shack scanners with a SEARCH mode use some form of the Zeromatic function. It is probable that this mod can be adapted to them, but it is beyond the scope of this article to lay out procedures for them all. Zeromatic circuits differ from one model to the next, but just happen to be functionally the same for the popular PRO-2004/5/6 series.

■ It Gets Better

If this version of the Zeromatic Mod trips your trigger, there are enhanced versions of it—much too detailed to include here—that appear in the current issue, V5N4, of the *World Scanner Report* (PO Box 262478, San Diego, CA 92196-2478 for info).

■ Contest Time

Not that I'm brain-damaged or anything, but I'm going to kick back for a few months after a year's intense work on my latest book, the *Ultimate Scanner*. I want you guys 'n gals to do some of the work for a change so I can rest. To those of you good readers who can be enticed from your couches, there will be an autographed copy of my *Ultimate Scanner* book for any radio mod or novel experimenter's circuit that I select for publication in this column. The offer is open for one year from this issue. Submit your project (or proposal) directly to me—ideally via one of my e-mail addresses at the top of this article, or my postal address shown just above. Even if you have nothing to contribute, I always entertain ideas for projects, so tell me what you want. SASE's and project submittals always get a reply.

Summer's here; let's party.

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Upgrade Your Hand-held's Antenna Performance

Over the years I have read several articles about the gain in weak-signal performance obtained by adding a simple wire-radial at the base connector of a handheld's antenna. I was skeptical; surely they exaggerated. Well, I recently did some tests concerning the effect of adding such a radial and I must say I was pleasantly surprised.

In this test the antennas used were a stubby duck about 3-1/2 inches long, a rubber duck about 7 inches long, a telescopic 1/4-wave whip and a telescopic 5/8-wave whip. The radial used was made of light-gauge, stranded, insulated wire attached to the base of the handheld as shown in fig. 1. During operation the radial just hung limply down from the handheld.

My tests were done on the two-meter ham band. For transmission and for weak-signal reception, the use of the radial gave significant improvement with all antennas. Although the S-meter on one receiver indicated increases of 2 or more S-units (12 dB or more!) when using the radial, I expect that this receiver's S-meter was too generous. Repeating some of the tests using a commercial TV field-strength meter suggests that the improvement would typically be more on the order of one S-unit or somewhat less. Nevertheless, it was obvious that use of the radial often gives a worthwhile increase in signal strength.

■ It Works!

Obviously the addition of the radial did actually improve signal readability for some weak signals. For the *really* weak signals I sometimes had to turn my body (holding the handheld) to a new position to obtain the radial's benefit, so try turning and moving around to get the best signal strength. By the way, this "turning and moving to get the best signal strength" is useful for weak-signal, handheld work whether or not you use a radial, but why the radial should improve weak-signal reception only in certain spots is not clear to me. Also not clear to me was why, in a few instances, addition of the radial actually made signals weaker.

■ Let's Make One

1. Determine the length of the radial you will need based on your frequency of operation. Its length is given by the formula that follows..

$$\text{Length(inches)} = 2808 / \text{frequency in MHz}$$

- or -

$$\text{Length(centimeters)} = 7132 / \text{frequency in MHz}$$

For instance, at 100 MHz, length = 2808/100 or about 28.1 in.

If you want to utilize the radial technique for a band rather than for one specific frequency try three radials all connected together at the top end, one cut for the center of the band and one cut for near each band edge. Any limp insulated wire will work OK; thick or stiff wire tends to be harder to manage.

2. The radial is not attached to the antenna element but to the shell of the antenna connector. You can add a wire loop at the end of the radial and set this loop over the antenna connector before attaching the antenna (fig. 1). Alternately an appropriate size of the type of clip which is sometimes called a "charger clip" or "claw" (shorter and broader jaws than an alligator clip) can be used to attach the radial to the base of the antenna connector.
3. Whenever you encounter a weak signal, attach the radial, let it hang down its full length from where it is attached to the handheld. Don't forget that you may need to turn the squelch down, or even off, for weak signals. The radial can be removed for most monitoring and left in your purse or pocket until it is needed.

■ When is an "aerial" an "antenna?"

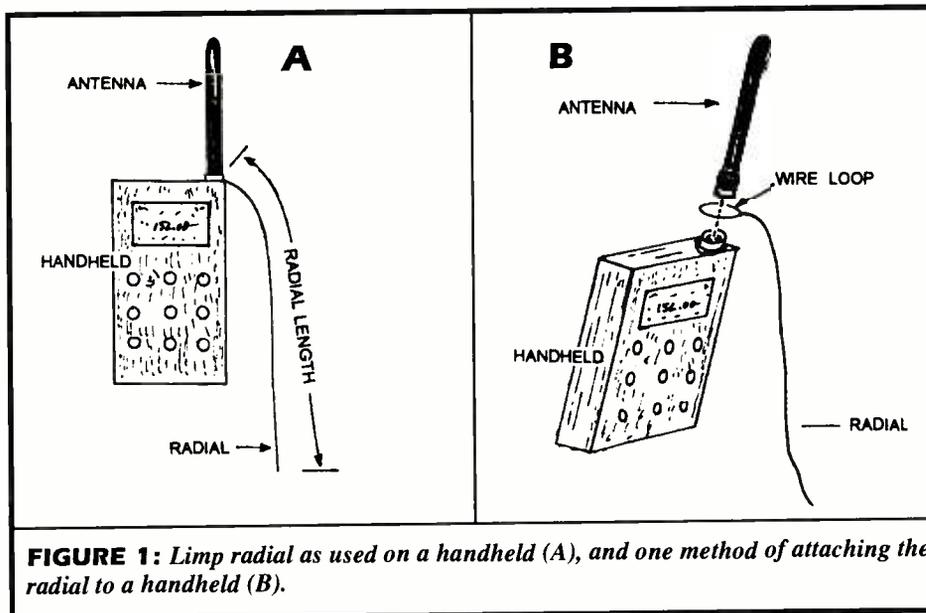
In radio's early days, aerials were very long and mounted quite high, usually 100 feet or more. This length and height was needed at the low frequencies then in use to collect enough energy to allow good reception with the insensitive receivers of those days.

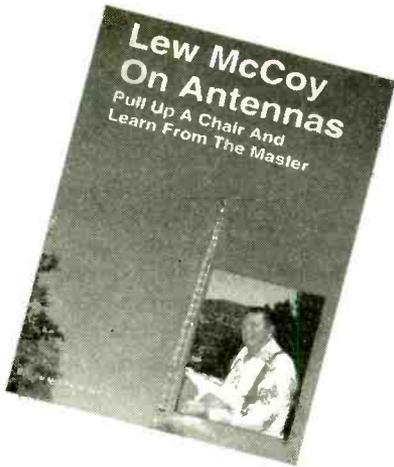
The term "aerial wires" was already in use in those days as a name for elevated wires such as telegraph wires and was a natural name to select for radio aerials. When receivers became more sensitive, much shorter and lower antennas—even antennas contained within the radio itself—could support good reception, and the term "aerial" was no longer appropriate for all aerials.

So, due to the similarity of function between insect antenna and radio aerials, the fact that both received signals and passed them on to a detector, the old-time name "aerial" was changed to "antenna." Coincidentally the word "antenna" was originally derived from the Greek "anateino" which means "to stretch up," which describes just what both insect antennae and radio antennas usually do!

■ A Book of Practical Antenna Information

Lew McCoy, WHICP, a top-notch DX, amateur-radio operator, and well-known writer, has a reputation as a man who knows





the ins and outs of antennas. In the 100-plus pages of *Lew McCoy on Antennas* he shares with the reader his considerable experience on such things as antenna basics, SWR, antenna to feedline matching, wire antennas, beam antennas, multiband antennas, mobile antennas and more. This book will appeal primarily to the amateur radio operator interested in HF work; however, it does have one chapter on VHF antennas. There are good practical discussions of such concepts as matching, impedance, reactance and the performance of various antenna designs. *Lew McCoy on Antennas* is available from CQ Communications, 76 N. Broadway, Hicksville, NY 11801 at \$15.95 plus \$4.00 S/H.

RADIO RIDDLES

Last month:

Last month I said, "Speaking of grounds, what would happen to your reception if you took down your HF, MF, or LF antenna, insulated it, and buried it in the earth?" Well, believe it or not, they all might still work! Particularly the MF and LF antennas. But they would be changed in their resonant frequency and they would not likely be as responsive to signals as before they were buried.

Because the earth in many locations is a poor electrical conductor, radio waves can pass through it to a certain extent. In other words, when the earth's conductivity is very poor the electrical ground that a radio wave encounters (radio ground) may be many feet below the surface of the earth.

An antenna buried near the surface of the earth in such cases is still some distance above radio ground and will still have some access to radio waves. The legendary radio pioneer, Guglielmo Marconi, once laid antennas directly on the dry sands of a desert and achieved excellent communications; the antennas on that dry sand were high above radio ground. On the other hand, the conductivity of wet sand or soil is much higher than that of dry or

rocky soil and signals will be reduced much more for antennas buried in wet soil.

In spite of what we just said about moisture, it may surprise you to know that underground antennas, and even underwater antennas, are sometimes employed with satisfactory results. Buried and underwater antennas are known for quiet reception and are more safe from lightning-induced damage than elevated antennas. Nevertheless, for really good reception we still put our antennas high and in the clear.

This Month:

In *Lew McCoy on Antennas*, reviewed above, Lew says "... anything that will conduct RF can be used as an antenna, even a multi-band antenna." Does that include paper clips, lawn chairs, automobiles, and refrigerators? Or has Lew just "lost it" and started making wild claims?

We'll have the answer to this month's riddle and much more in next month's issue of *Monitoring Times*. 'Til then, Peace, DX, and 73.

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SCANCAT supports most radios by:
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SCANCAT 6.0 FEATURES

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- Log found frequencies to files while scanning.
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We simply don't have the space to tell you ALL the new GOLD features
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- Link up to 15 frequency disk files.
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- Scan HF & VHF Icom's simultaneously.
- PRINT to ANY printer, or Disk File.
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- Link up to 15 search banks.
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- Search by CTCSS & DCS TONES with PRO2005,6/2035 (& ICOM/DC440).
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PLUS - POWERFUL COMMERCIAL FEATURES SUCH AS:

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SCANCAT 6.0	\$69.95	from any version	
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OPTOScan456 kit	\$299 (\$10 s/h)		

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FREE DEMO ON BBS

Q. *How does static build up on an antenna, and should I use heavy-gauge wire for best performance? (KM)*

A. Friction of air molecules can carry massive charges; this is what causes lightning bolts between the ground and clouds. The electric voltage between the earth and various altitudes of charged air masses is called "voltage gradient" and may approach tens of millions of volts at upper elevations.

With a tall antenna, a differential of thousands of volts is quite likely under some circumstances. This will harmlessly bleed off to the earth if the system is grounded (such as through a metal tower or mast), but if the path is broken by a transformer or blocking capacitor, destructively-high voltage may build up and discharge by a spark, causing equipment damage.

Lightning arrestors are helpful, as are ground lines to actual earth connected to an eight-foot ground rod in moist soil. Keep antenna lines disconnected from equipment when left unattended for long periods of time, especially during storm season.

So far as wire gauge goes, that's only important for transmitting to prevent resistive losses from lowering radiation efficiency. For receiving purposes, any gauge of wire which will support its own weight, solid or stranded, insulated or uninsulated, and made of any metal, will work equally well. Any nominal difference in efficiency will be unnoticeable.

Q. *I would like to make my own scanner antenna. What is better about half-wave or full-wave-length antennas over the usual quarter-wave? Are multi-band antennas compromised? Where can I buy the parts to make one? (Bob S.)*

A. Most scanner antennas are really a half-wavelength in design; a mobile quarter-wave whip is mounted on a metal vehicle surface which emulates the "missing half" of the antenna. A quarter-wave rubber ducky on a hand-held radio depends upon the metal of the radio, as well as the human holding it, to make up for the missing length. Some purists hang a quar-

ter-wave wire down from the BNC connector for a more perfect impedance match.

While a full-wavelength antenna could theoretically increase reception by 3 dB (half an S unit), its pattern favors the ends of the antenna, making such a vertical antenna favorable to signals above it and under it, not toward the horizon where we want it.

Multiband antennas often employ a cluster approach—several elements of different lengths commonly connected to the coax. Another method is to use one vertical element, divided along its length by a coil which decouples the two sections, each working at a different frequency and its harmonics.

Several excellent books on antenna design are available from Grove Enterprises and other MT advertisers, including the ARRL *Antenna Book*, Joe Carr's *Receiving Antenna Handbook*, Clem Small's *Antenna Handbook*, and my own new *Antenna Factbook*.

You can sometimes salvage old TV antennas for elements and insulators, and welding rod from automotive supply houses make excellent mobile elements when soldered to connectors available from Radio Shack.

Bob's Tips of the Month

Cable and Adaptor Losses

We are often warned not to use too many **adaptors** because they contribute signal loss. But how? And how much? Recently we connected five, low-cost (imported), nickle-plated adaptors—a variety of types—in series and tested the concoction at 1000 MHz. We saw no detectable loss whatsoever!

So what might cause loss? Some adaptors suffer from non-standard threads and, when attempting to attach them to a mating connector, they don't make a snug fit. This is an invitation to corrosion, erratic contact, and noise.

A frequent cause of poor reception (and transmission) is **connector damage**. Inexpensive BNC connectors—the kind found on most amateur two-way gear and scanners as well—employ a prong-type center connection. When the male connector wiggles back and forth, it eventually spreads the prongs so they no longer make good contact. They can be brought together again, however, by wedging a sturdy needle between the outer edges of the prongs and the adjacent insulation.

Another common source of damage is cause by attempting to attach a common PL-259 (UHF male) connector to a female N connector as found on the ICOM R-7000 and 7100. The large center pin on the PL-259 splays the delicate leaf center connection

in the N so that it no longer makes good contact. Fortunately, it, too, can be pinched back together gently with long-nose pliers.

Generally speaking, silver- or gold-plated connectors and adaptors, especially if they bear a brand name, are safe bets. Don't use adaptors if a correct, single connector is available. Be sure that the adaptor (and connector) threads easily and securely to its mate, leaving no loose fits. And don't expose the connector to weather—wrap it in a weather-resistant sealant or tape.

How about the **coax**? What's good and what's bad? For receiving purposes, it doesn't make any difference whether you use 50 or 70 ohm impedance cable; no antenna made is going to maintain a constant impedance over the wide frequency range of modern receivers and scanners, and the slight impedance mismatch will be undetectable in terms of signal loss.

Below 30 MHz, and with runs of no more than 100 feet or so, inexpensive RG-58/U is just fine, even for transmitting up to 200 watts or so. At VHF and especially UHF, be more discriminating; RG-59/U indoor TV coax will work great for runs of 50 feet or so well into the 800 MHz range, while RG-6/U is slightly better for longer runs—approximately equal to the king of coax, Belden 9913. Use the heavier cable for transmitting.

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. After reading the seismic transmitter frequencies in "After the Shock" (MT July 94), I wondered if I could watch a tremor on an oscilloscope and get hard copy on a pen recorder? (Dick Milligan, Sequim, WA).

A. Sure; that's what the professionals do. Keep in mind, however, that the fluctuations are subsonic, often taking several seconds for one cycle. Unless you have nothing better to do, an occasional glance at the pen (or chart) recorder will be much less boring than staring at an oscilloscope.

Q. My Radio Shack DX440 (Sangean ATS803A) reads 1 kHz high on all frequencies; when I try to zero-beat a signal with my BFO (SSB mode), the knob must be set 1 kHz high as a result. Is there an adjustment internally that I can make to set it right on frequency? (Stephen Price, Johnstown, PA)

A. There are actually two ways to go about this. One is to adjust the trimmer capacitor alongside the oscillator crystal; the other is to adjust the BFO coil which determines the product detector frequency in the SSB mode.

Don't adjust the oscillator trimmer unless you have determined that it is, in fact, off frequency. You can do this in the AM mode by turning the tuning dial slowly back and forth across the signal frequency, noting whether or not the signal deteriorates equally on both sides of the signal frequency. If not, the oscillator crystal can be adjusted.

More likely, the BFO coil should be tuned. You will need a schematic diagram to find it.

Tune in a strong signal on its exact frequency, switch on the SSB mode and adjust the coil carefully until the pitch decreases to zero beat.

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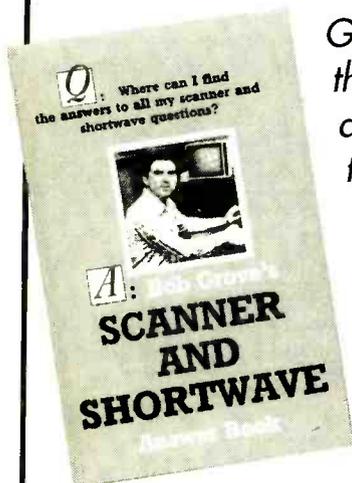
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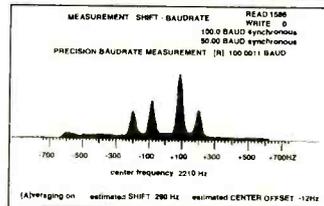
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(Continued from page 4)



Joe explains, "The 'Amazing Desert Storm Technology' that the ad speaks of is simply the antenna tip the armed forces use on the ends of the antennas to keep them from poking somebody's

eye out when the antenna is lashed down to the vehicle! (Power lines contacting your equipment is not good, either.)

"According to my old Commo Section Chief, it doesn't make a difference whether or not it's on the antenna .. only if you meet it eye-to-eye. No 'special technology,' just the military's way of keeping injuries down (and maybe some mothers happy)... jeeze!"

SWL Speaks Up

■ In the same issue, Larry Miller philosophized about how much cross-over in interest there is (or isn't) between shortwave broadcast listening and scanner listening. Elaine Payne of Bessemer City, North Carolina, wrote to testify to her own experience. She says, "I was very badly scared one day when my six-year-old son's bus was very late—so my husband bought me a Radio Shack PRO 2034 60-channel scanner (great for beginners!). I was absolutely amazed at how much I enjoyed scanning. It was like discovering a whole new world!

"Also, I was so impressed with the hams that I studied *Now You're Talking* and got my ham ticket—KE4YYJ—so I also enjoyed Uncle Skip's article about preparing for a ham license. Please pass on that it took exactly two weeks for my ticket to arrive.

"I really hope anyone interested in exploring different parts of the radio spectrum will go for it. I'm looking forward to getting the kids interested. I enjoy *MT* so much more, too!"

What a Dish!

■ "A minor correction," begins Bill Wood WB6FXJ, of Barstow, CA, "to the photo caption in your April 'Communications' column. The caption illustrating the 'Project Phoenix' piece notes that the 64-meter Parkes parabolic antenna is the '...largest steerable radiotelescope in the southern hemisphere...'

"While that claim was true prior to 1972, when the 64-meter Deep Space Network antenna at Canberra, Australia, was constructed—tying the record—the extension of that antenna to 70-meters in 1987 now makes it the largest.

"While this antenna is used primarily to support the NASA Deep Space program, it is used extensively for radio astronomy by Australian scientists as well as others around the world. It is occasionally used in tandem with the Parkes 64-meter antenna to nearly double the signal-gathering power of either antenna alone. The two facilities are connected by a microwave link that allows combining the signals together to increase the sensitivity by 3 dB.

"How do I know this? I recently retired from the Goldstone Deep Space Communications Complex, the sister Deep Space facility to Canberra and to a nearly identical facility near Madrid, Spain. Enclosed is a photograph (shown below) taken shortly after the Canberra 70-meter antenna was returned to service after being extended to 70-meters in 1987. During this process the subreflector and entire surface of the dish were replaced with new, highly accurate, components that are specially shaped to reduce the spherical aberration normally present in two-surface telescopes."



Let's Get Priorities Straight

■ Chris Dickinson of Brick, New Jersey, has a message for scanner manufacturers: "In an age of technology where we go from frequency combs to crystals, eight channel scan to 1000 or so, from auto search to data skip, we are still plagued with the age-old, interrupting, priority search.

"It is so annoying to hear (or not hear), *There's a fire at --- North Avenue, and there is a 10 --- going down on --- Street.*

"I am not Mr. Dolby or Mr. Data Skip, but surely there must be *someone* who is concerned about the silent priorities. I own a pocket computer that, while I am computing, keeps time and interrupts me when (and *when* is the key word) the alarm goes off. It doesn't keep interrupting with messages or alarms to remind me that it's doing its job.

"Come on, you technicians: multiple cellular phone conversations on the 800 MHz police frequencies is cute, but let's get our priorities straight."

From the Editor

■ In spite of the seemingly dire warning of our cover story on the proposed Project 25 standards, there is no need to panic yet. "Five to ten years for implementation sounds extremely optimistic to me," says publisher Bob Grove. Considering how long it takes for any of the participating agencies to agree on and implement even internal changes, it seems unrealistic to expect such a complicated cooperative agreement to be forthcoming soon. The current budget-cutting environment would also suggest that the turn-over to new technology may be slow.

May's feature article on scanner collecting makes me realize what a brief phenomenon scanners have been. Project 25 aside, when you consider the changes we've seen in the past ten years, today's scanners would probably be outmoded in another ten years anyway. What this report does do is to alert the public to what is being planned. The fact that Project 25 mandates backward-compatibility with analog technology is good news; whether or not scanning receivers will be brought into the digital loop is what we don't know and where we should direct our lobbying efforts.

The message for us all is that tomorrow is a mystery yet to unfold; therefore, "seize the day" and make the most of today's monitoring times!

—Rachel Baughn, editor

Below are the fractional grids described by Al Gross on page 4.

	1	2	3	4	5
1	F	R	A	C	T
2	I-J	O	N	L	B
3	D	E	G	H	K
4	M	P	Q	S	U
5	V	W	X	Y	Z

Fractional

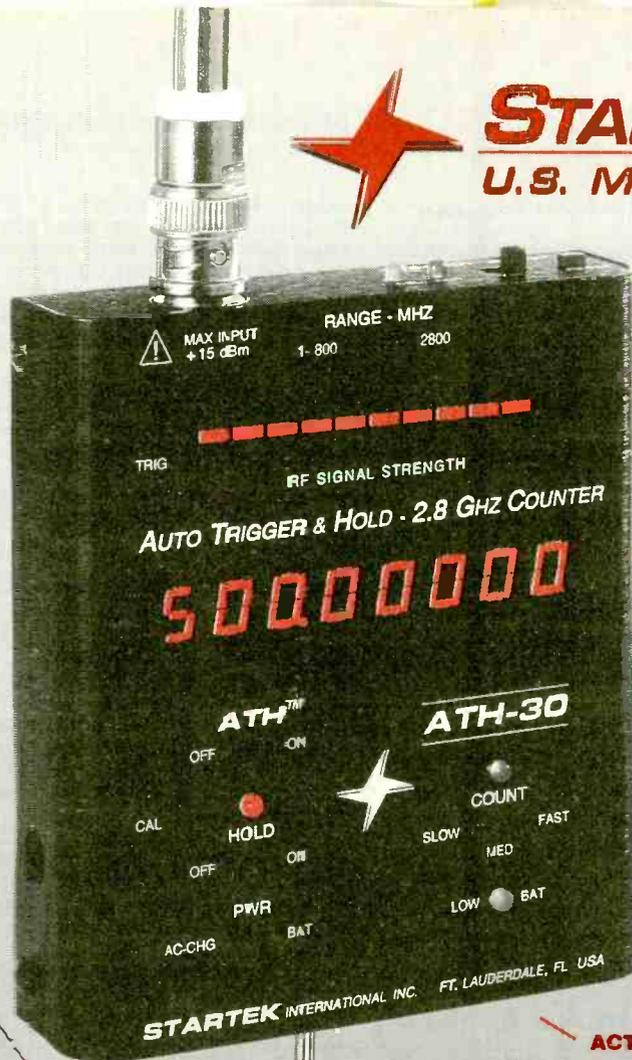
	6	7	8	9	0
1	F	R	A	C	T
2	I-J	O	N	L	B
3	D	E	G	H	K
4	M	P	Q	S	U
5	V	W	X	Y	Z

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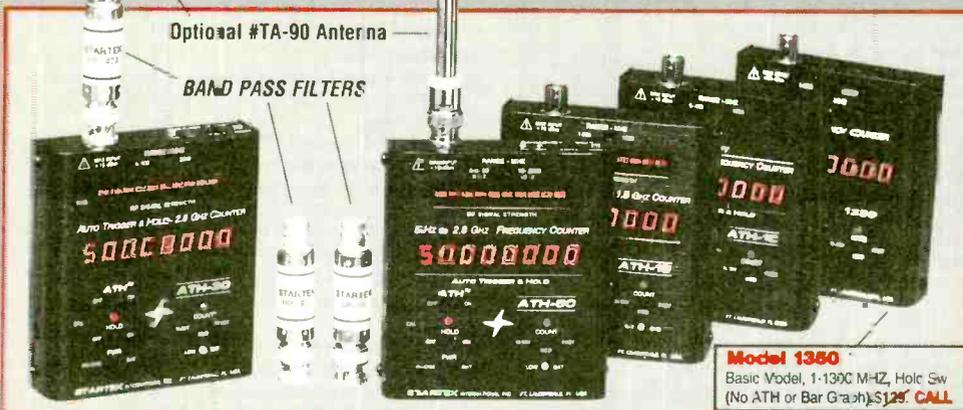
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#RD-2750	2" & 5C MHz Rubber Duck Antenna	19
#RD-450	450 M-Z Rubber Duck Antenna	16
#RD-800	Cellular phone band RD Antenna	16
#P-10	200 M-Z 1X-10X Probe	39
#LP-22	Low Pass, Auto Probe	25
#DC-10	Direct, 50 OHM Probe	20
#DC-5	BNC Cable to Clip Leads	12
#W-2074C	Interface Cable MFJ Ant. Analyzers	10
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All Ohio Scanner Club: Dave Marshall, 50 Villa Rd., Springfield, OH 45503-1036. U.S. northeast of the Mississippi; VHF/UHF/HF utilities. Net Mon 9:30pm 146.940. *American Scannergram*. \$18 U.S., \$21 Can/Mex, \$28 ww. \$3 sample. Annual summer meeting.

American SW Listener's Club: Stewart MacKenzie, WDX6AA, 16182 Ballard Lane, Huntington Beach, CA 92649, (714) 846-1685. Western US, Pacific, Asia. SWBC, utilities, longwave, clandestine. SWL \$20 US, \$22 Can/Mex. \$1 sample (\$2 ww). Meets 1st Sats 10am address above.

Association of Clandestine Enthusiasts (A.C.E.): Kirk Baxter, P.O. Box 11201, Shawnee Mission, KS 66207. US, Europe and Middle East; Pirate and clandestine. *The A.C.E.* \$18 US, \$19 Can/Mex, \$25 ww.

Association of Manitoba DX'ers (AMANDX): Shawn Axelrod, 30 Becontree Bay, Winnipeg, Manitoba, R2N 2X9 Canada, (204) 253-8644. Manitoba; LW, MW, SW, and VHF/UHF. Meets monthly. \$2. Info for the New DXer.

Bay Area Scanner Enthusiasts: Bruce Ames, P.A.O., 105 Serra Way #363, Milpitas, CA 95035, (408)267-3244. Western U.S.; 25+ MHz. *Listening Post* (bi-monthly). Meets 2nd Mons.

7:30 Milpitas Police Admin Bldg. \$25 US, \$2 sample, or SASE for info.

Bayonne Emergency Radio Network (BERN): Ray Baron/Bob Frasca, P.O. Box 1203, Bayonne, NJ 07002-6203, 1-800-286-2876. Metro NJ, NY; Fire/disaster, pub safety.

Bearcat Radio Club: Larry Miller, Box 360, Wagontown, PA 19376, 1-800-423-1331. National. Scanning only. *National Scanning Report* (bi-monthly). \$17.50 or \$29.90, \$5 more Can. \$3 sample.

Boston Area DXers: Paul Graveline, 9 Stirling St., Andover, MA 01810-1408, (508)470-1971, 50 mile radius Boston; 3-30 MHz. Meets 3rd Fris 7:30pm, The Lexington Club, Rte 4/225 1/4 mi W of Rte 128.

Canadian Int'l DX Club: Sheldon Harvey, 79 Kipps St., Greenfield Park., Quebec, Canada J4V 3B1, (514)462-1459. Canada nationwide/ membership open to all; General coverage. *The Messenger*. \$26 Can, \$25 US, \$US28 or \$Can35 ww. \$2 sample. Meets 2nd Tues 7pm Montreal; several annual events.

Capitol Hill Monitors: Alan Henney, 6912 Prince Georges Ave, Takoma Park, MD 20912-5414, (301) 270-2531/5774 fax. DC, MD, No.VA, So.DE.

Listener's Nets

You are invited to post your North American amateur radio net in this bi-monthly listing if its primary emphasis is devoted to the radio monitoring hobby.

Capitol Hill Monitors

146.91 MHz 1st & 3rd Mon 7:30pm ET, DC, Md, N.Va, S.Del; Scanning and amateur radio Frequency Forum BBS 703-207-9622 [8-N-1] Net Mgr: N3RDC, John Korman Call Alan Henney 301-270-2531 or John Korman 301-299-5455 for info Newsletter \$8; 6912 Prince George's Ave, Takoma Park, MD 20912-5414

Central Florida Listeners Group

146.730 MHz, Sun 8pm ET, Central Florida; any radio communications outside amateur bands Net Mgr: Andy Fountain, KD4OKJ Telephone gateways announced; CFLG BBS conference on LASER BBS 407-647-0031 Call Andy Fountain, KD4OKJ, (407)898-6784 for info

Larkfield's ARC SW-Scanner Net

147.210 MHz, Fri 8pm ET, Long Island, NYC, NJ, Conn; Shortwave BCers & utes, MW, amateur radio, scanning Net Mgr: Hank Lukas, N2GCN Open to all amateurs on air; by letter for scanner listeners Contact: P.O.Box 115, Plainview, NY 11803-0115

Listening Post

147.03, 224.96, 447.725 (W3DID/R), Sun 8pm, Baltimore and metro area; non-amateur transmissions DC to Daylight except ECPA-related items or tacticals Net Mgr: Mike Agner KA3JJZ Open to all amateurs on air; by maildrop at: 6710-F Ritchie Hwy #236, Glen Burnie, MD 21060. Packet: KA3JJZ @ WB3FFV.md.ena.usa

Montreal DX Listeners Net

146.910 MHz, Sun 8:15 pm ET, Montreal PQ area; MW SW, & Scanner Net Mgr: Sheldon Harvey VE2SHW Telephone gateways announced **Monitoring the Long Island Sounds Net** 146.805 Tues 8pm ET, Long Island, NY; Primarily scanning

Net Mgr: WB2RVA, 2134 Decker Ave, North Merrick, NY 11566

Monix SW and Scanner Listeners Info Net

146.835 MHz, Thurs. 9:30 pm ET; Cincinnati/Tri-State Area; All band Net Mgr: Mark Meece, N8ICW, (513) 777-2909 (no collect calls) Open to all amateurs; Telephone gateways to net mgr up to 1/2 hr before net; The Listening Post BBS (513) 474-3719

New York DX Association

146.880 Mon 9pm ET, NYC area; "DC to Light" Net Mgr: Charles Hargrove N2NOV, 723 Port Richmond Avenue, Staten Island, NY 10302-1736 Voice mail 1/2 hr before net: 212-978-3375; CompuServe 73167,312

Northeast SW Listeners and Scanners Net; Rip Van Winkle Society

147.21 MHz (WB2UEB) Wed 8pm, Albany, NY, area.

Net Mgr: Ray Loeper N2RAD

Ontario DX Association - Listeners Net

442.375 (VA3ODX; 103.4Hz CTCSS tone), Sun 8:30pm ET; Toronto area coverage; LW, MW, SW, FM, VHF/UHF topics discussed Net Mgr: Stephen Canney, VA3ID Open to all; repeater used daily by ODXA members

Rocky Mountain Monitoring Net

147.225, 224.980 Denver; 145.460 Boulder; 145.160 Colorado Springs Sun 20:00; communications monitoring Brian Gould, KB0MEP, Mt. News Net **Shortwave Listeners Net**, Association of North American Radio Clubs 7.240 MHz LSB, Sun 10am ET, Eastern US; Shortwave broadcasts and utilities Net Mgr: KW3F, 238 Cricklewood Circle, Lansdale, PA 19446

Telephone gateways announced

Southern Wisconsin SW Listeners Net; MARA

147.150 MHz, alt 146.760 MHz. Madison, WI, area First Sun 8pm CT. Shortwave, scanning, dc to daylight, equipment notes and comments. Net Mgrs: N9LTD, KA9SRU, N9EWO Contact: N9EWO, Dave Zantow, 1609 Ontario Drive, Janesville, WI 53545

Scanner bands. Frequency Forum BBS 703-207-9622 (8-N-1) Net 1st & 3rd Mons 7:30pm 146.91. *Capitol Hill Monitor*. \$8. Meets irregularly.

Central Florida Listeners Group: Andy Fountain KD4OKJ, (407)898-6784. Central Florida; All bands. Net on 146.73 MHz Sun 8 pm. Meets 2nd Sats 12 noon. Conf#10 on Laser BBS (407)647-0031.

Central Indiana Shortwave Club: Steve Hammer, 2517 E. DePauw Road, Indianapolis, IN 46227-4404. Central Indiana; SW broadcasting, pirates, and the offbeat. *Shortwave Oddities*.

Central VA Radio Enthusiasts: Richard Rowland, POB 34832, Richmond, VA 23234-0832. Metro Richmond and vicinity. VHF/UHF. SASE. No newsletter, no dues. Meets quarterly in Richmond.

Chicago Area DX Club: Edward G. Stroh, 53 Arrowhead Dr., Thornton, IL 60476. 300 mile radius of Chicago; DXing all bands. *DX Chicago*. \$17, \$1 sample. Meets irregularly.

Chicago Area Radio Monitoring Association (CARMA): Ted & Kim Moran, 6219 N. Greenview, Chicago, IL 60660-1815. Chicago & midwest. Public safety & general coverage. SCUG/CARMA BBS (708)852-1292. *CARMA Newsletter*. Meetings (Sats) and newsletter bi-monthly on alternate months.

Colorado Shortwave Listeners Club: Rob Harrington NONNI, P.O. Box 370593, Denver, CO 80237-0593, 303-756-9455. Longwave, shortwave. *Colorado Shortwave Listener* (4x) 35 cents each, or Internet nonni@filebank.com. Meetings cancelled remainder of '95.

Communications Research Group: Scott Miller, 122, Greenbriar Drive, Sun Prairie, WI 53590-1706. Wisconsin area. Scanning.

DecalcoMania: Paul Richards, P.O. Box 126, Lincroft, NJ 07738, (908)591-2522. Worldwide AM, FM and collecting radio related items. *DecalcoMania*. \$10 US, \$11 Can/Mex, \$16 Eur, \$17.50 Asia/Pac.

Drake SPR4 Int'l Club: Bill Swiger, Route 1, Box 142A, Bridgeport, WV 26330. Worldwide; Drake SPR4 owners.

Fire Net: Tom Kravitz, Box 1307, Culver City, CA 90232, 310-838-1436, internet mpag@netcom.com. All of California; fire, EMS, tied in with nationwide notification net.

Global DX Club: David Williams, P.O. Box 1176, Pinson, AL 35126-1176; Internet: XYVD51A@Prodigy.Com. Worldwide; all bands. *Radio Waves* (bi-monthly). \$1 sample. Meets monthly.

Houston Area Scanners & Monitoring Club: Glen Dingley, 909 Michael, Alvin, TX 77511, (713) 388-1941. 75 mile radius of Houston, TX; scanning & SW. Paging network. *HASMC Newsletter*. Meets Jan & June.

Hudson Valley Monitors Association (HVMA): Patrick Libretti, P.O. Box 706, Highland, NY 12528. Mid-Hudson valley and surrounding counties; VHF/UHF, public safety. *The Hudson Valley Monitor*.

International 11 Meter Alliance: Allen Newton, Rt. 1 Box 187-A, Whitney, TX 76692, (817) 694-4047. Public safety, traffic handling, all bands, esp. 11 meters.

Int'l Radio Club of America (IRCA): Ralph Sanserino, P.O. Box 1831, Perris, CA 92572-1831. Worldwide; BCB/AM DX. *DX Monitor* (34 x) \$25 US, \$27 Can/Mex, \$28.50 ww. \$.29 or 2 IRCs sample.

Longwave Club of America: Bill Oliver, 45 Wildflower Rd., Levittown, PA 19057, (215) 945-0543. Worldwide; Longwave only. *The Lowdown*. \$18 US, \$19 Can/Mex, \$26 ww.

SPECIAL EVENT CALENDAR

Date	Location	Club/Contact Person
July 1-2	Weston, WV	West Virginia State Convention / Ann Rinehart KA8ZGY, 1256 Ridge Dr. S. Charleston, WV 25309, 304-768-9534
July 1-2	Scranton, PA	Scranton Pocono ARK / Al Zelna N3KAE, c/o K3CSG, 645 E Pine St, Olyphant, PA 18447. Loc: Steamtown Nat'l Historic Site, Scranton, Grand Opening. July 1 1800-2359Z, July 2 1500Z-2100Z. Send SINPO rpt + 9x12 SASE, 2 stamps.
July 2	Wilkes-Barre, PA	Murgas ARC / James Post KA3A, 1266 Sans Souci Pkwy, Wilkes-Barre, PA 18702, 717-825-3940.
July 2	Rhineland, WI	Northwoods ARC / Info: 5286 Sycamore St, Rhineland, WI 54501, 715-369-5194. Location: Taj Mahall, north on Stevens St to Pueblo Dr, Talk-in 145.370 and 145.430, 8am to 2pm, Adm \$2
July 7-9	Dunseith, ND	SPR Hamfest / Steve Allar N0ELA, 1701 6 Ave NE, Beulah, ND 58523. Location: Int'l Peace Gardens north of Dunseith, ND. Talk-in 146.850 (-) and 146.520 smplx
July 8	Salisbury, NC	North Carolina Alligator Group / Walter Bastow N4KVF, 3045 High Rock Rd, Gold Hill, NC 28071, 704-279-3391
July 8	Oak Creek, WI	South Milwaukee ARC Swapfest / Robert Kastelic WB9TIK, PO Box 102, South Milwaukee, WI 53172-0102. Location: American Legion Post 434, 9327 S Shepard Ave, Oak Creek, WI. Talk-in 146.52 smplx, 7am-2pm CDT. Adm \$4
July 8-9	Indianapolis, IN	Central Division Convention / Jim Rinehart WB9CEP, 1455 N Shannon Ave, Indianapolis, IN 46201, 317-356-1908
July 9	Timonium, MD	Baltimore RA TV Society / Robert Koblish N3HAT, Box 43723, Baltimore, MD 21236, 410-243-1339. Location: Timonium Fairgrounds, York Rd off I-695, I-83. Talk-in 147.03+, 224.96/-, Open 8am, Adm \$5
July 9	Jackson, MI	Cascades ARS / Terry Osborn KD8B, 508 Dalton Rd, Jackson, MI 49201, 517-784-2398
July 14-16	East Glacier, MT	Montana State Conv & Glacier/Waterton Intl Hamfest / Darrell Thomas N7KOR, 743 33rd Ave NE, Great Falls, MT 59404, 406-453-8574
July 14-16	Lancaster, PA	Bearcat Radio Club & Nat'l Scanning Convention / PO Box 360, Wagonton, PA 19376, 1-800-423-1331. Location: Lancaster Host Resort, Adm \$15
July 14-16	Boise, ID	Int'l Radio Club of America Conv / Frank Aden, Jr, 4096 Marcia Pl, Boise ID, 208-377-5346. Location: Owyhee Plaza Hotel
July 15	Clinton, ME	Maine Council of AR Clubs / Robin Walls N1NFK, 34 Tufton St, Brunswick, ME 04011, 207-442-9405
July 15-16	Atlanta, GA	Atlanta Radio Club / Jim Spencer WD4NFT, 3559 Castlehill Way, Tucker, GA 30084, 404-908-8552
July 16	Van Wert, OH	Van Wert ARC / Louie Thomas WD8LLO, 208 N Chestnut St, Van Wert, OH 45891, 419-238-2812
July 16	Cambridge, MA	MIT Radio Soc & MIT Electronics Research Soc / Steve Fineberg W1GSL, PO Box 397082 MIT Branch, Cambridge, MA 02139-7082. Tailgate electronics, computer, amateur radio FLEA MARKET - 9am-2pm. Albany & Main St. Admission \$2. Free parking. Talk-in 146.52, 449.725/444.725 - pl 2A - W1XMR
July 17-22	LaPorte, IN	LaPorte ARC Sesquicentennial of LaPorte County Fair / K9JSI 1500-0400 UTC July 17-22. H.F. General portion of 75-40-20-15-10 Meter Phone Bands. QSL and SASE #10 envelope to LaPorte Radio Club, PO Box 30, LaPorte, IN 46350
July 21-23	Flagstaff, AZ	AR Council of Arizona / Cliff Hauser KD6XH, 8741 N Hollybrook Ave, Tucson, AZ 85741, 602-744-9095
July 21-23	Renton, WA	Western Washington DX Convention / Mary Lewis W7QGP, 10352 Sand Point Way NE, Seattle, WA 98125, 206-523-9117
July 22	North Bend, OR	Coos County RC / Zane Albertson WA7OXM, Rt 1 Box 199 D6, Coquille, OR 97423, 503-396-5778
July 22	Huntington Mills, PA	Jonestown Mountain Repeater Assoc / Charles Hooker, AD3L, PO Box 23, Huntington Mills, PA 18622, 717-864-2571
July 23	Sugar Grove, IL	Fox River Radio League / James Von Olmhausen N9UZZ, 405 Davis Rd, Batavia, IL 60510-1306, 708-879-3042. Loc: Waubensee Community College, Rte 47 at Harter Rd, 5 mi NW of Aurora, Talk-in W9CEQ 147.210 (+600)(PL 103.5/107.2) - AFAR, Open 8am, Adm \$5
July 23	Indiana County, PA	Indiana County ARC Summerfest / Tom Ringler WA3W, 412-349-8847, Location: Red Barn Sportsman Club. Adm \$2
July 29	Carlinville, IL	Macoupin County ARC / Dennis Goessmann N9LQC, 115 S Center St, Carlinville, IL 62626, 217-854-2365
July 29	Asheville, NC	Western Carolina ARS / Tommy Queen K4BNP, 12 Lynwood Cir, Asheville, NC 28806-2114, 704-258-2639
July 29	Berwick, PA	Columbia Montour ARC / Dave Schack WC3A, 6020 Ft Jenkins Ln, Bloomsburg, PA 17815, 717-752-6851
July 29	Texas City, TX	Tidelands ARS / Bill Steele WA5WVP, PO Box 892, Texas City, TX 77590, 409-948-0308
July 29-30	Manchester, NH	New England Division Convention / Alan Shuman N1FIK, 297 Weare Rd, New Boston, NH 03070, 603-487-3333
July 30	Stickney, IL	DuPage ARC / Edwin Weinstein WD9AYR, 7511 Walnut Ave, Woodridge, IL 60517, 708-985-0527
July 30	Port Huron, MI	Eastern Michigan ARC / Henry Kohl K8DD, 1640 Henry St, Port Huron, MI 48060, 810-982-7088

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:

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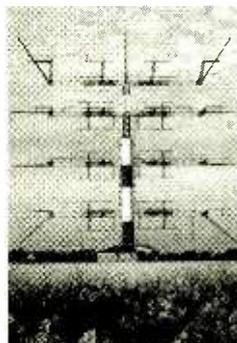
Echoes of France

By Jacques d'Avignon

When Radio France International and TDF, their common carrier, established the new schedule for the summer of 1995, they scheduled an English program to North America between 1200 and 1300 UTC. However, North America being a large piece of "real estate," it was decided to use two transmitters to cover as much territory as possible.

The first transmitter was Issoudun in France, assigned to cover Eastern Canada and the East Coast of the USA. So far, so good! It was then decided to use the same frequency on both transmitters—the second transmitter being in French Guyana. This can be done, but it is imperative that there be an audio delay in the transmitter feeds.

Well, the audio delay between both transmitters was 628 milliseconds. The audio to Issoudun is direct, but to French Guyana there are



two satellite relays involved. RFI had not installed an audio delay line in the Issoudun audio transmitter feed, so that the French Guyana was coming in as an "echo!" It created an interesting effect: if you lived in Texas, the "echo" was stronger than the first signal, but if you lived in my part of the world (Canada), it was a toss-up as to which transmitter one would hear the strongest at any given moment! In other words, the transmission was useless to me.

Eventually, the delay line was installed and TDF contacted me to hear their "new and improved" signal. In order to determine exactly which transmitter I was receiving, one of the transmitters was turned off for about 30 seconds while the staff in Paris listened to my audio feed back to them. I was receiving the signal here in Kingston, Ontario, at S9+ 40 dB, and when one transmitter was turned off, the signal dipped only about 10dB. The frequency on both transmitters is now so accurate that no beat is heard at any time.

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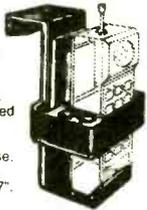
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The End of an Era ... Musings with an Old Friend

It was with much nostalgia that I read the news release from CQ Communications, publisher of *Popular Communications* magazine, that Tom Kneitel, editor since the inception of the magazine some thirteen years ago—just after I published the first edition of *Monitoring Times*—was retiring from his editorship. He will remain on board, however, as a feature writer, retaining the title of Senior Editor. Chuck Gysi will assume the post of Editor.

I hate to see Tommy's editorial byline disappear from the *PopCom* masthead; he is a pioneer in the hobby of radio monitoring and his writing style never failed to inspire—or infuriate—his readers. I called Tommy to chat about old times. We have held a parallel course in our hobbies and professions over the decades and, although we've never met, we are old friends.

We've often chuckled about the imaginary feud that supposedly existed between us as competitors when, in truth, our relationship couldn't be more cordial. It seems incomprehensible to some readers that competition can't be friendly. But friendly it is, and it comes from mutual respect.

Tommy started writing in 1955, and took the helm of *CB Horizons* along

with TVRO guru Bob Cooper in 1961; a year later, at the expiration of his contract, Tommy assumed the editorship of *S9* magazine where he remained for twenty years. A prolific author, he wrote the first edition of the popular *Confidential Frequency List*. I wrote the next two editions.

A heart attack ten years ago, recurrence of the disabling consequences of childhood polio, and the stress of deadlines have given Tommy cause to reflect. I'd love to feature him as a guest speaker at our annual listeners' convention in Atlanta, but he prefers not to make the trip.

Tommy's family is as colorful as he is. Two daughters are with the Clyde Beatty/Cole Brothers Circus—one rides the elephants and the other, an office worker, is married to the cotton candy man! A son is with the sheriff's office and another son is a nuclear physicist at Brookhaven. His grandfather was Max Fleischer, creator of the "Betty Boop" cartoon character.

I wish Tommy a happy semi-retirement with plenty of fishing, pleasurable hamming, and boundless scanner listening. I've enjoyed our camaraderie for the many years we've shared the hobby radio spotlight, and look forward to many years to come.



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- Cable/Adaptor SCOUT Reaction Tune Pat. Pend.
- CC30 Carry Case for SCOUT

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- OPTOSCAN456
- Accessory Set

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Includes

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Includes:

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IC-R1



- Dimensions: 1.9 (W), 4.0 (H), 1.4 (D), 9.9 oz
- 100 kHz - 799 MHz
900 MHz - 1300 MHz
- AM, FM, WFM
- Compact
- 100 Memories
- External Battery (opt)
- Internal Battery (Standard)
- Multiple Scanning
- Sleep Timer
- Model R1-08 for Government Sales (same price)

IC-R100



- Dimensions: 5.9 (W), 2.0 (H), 7.1 (D), 3.1 lb
- 100 kHz - 799 MHz
900 MHz - 1856 MHz
- AM, FM, WFM
- Mobile
- 100 Memories
- 20 Scan Edge Memories
- RF Attenuator (20dB)
- Preamp (15 dB)
- 24 Hour Clock
- AFC
- Auto Noise Limiter
- Keyboard Entry
- Model R100-03 for Government Sales (same price)

IC-R7000*



- Dimensions: 11.3 (W), 4.3 (H), 10.9 (D), 17.6 lb
- 25 MHz - 999 MHz
1025 MHz - 1999 MHz
- SSB, AM, FM
- Keyboard Entry
- 99 Memories
- Multiple Scan
- Remote Control (opt)
- Voice Scan
- TV Reception
- Voice Synthesizer (opt)

IC-7100A



- Dimensions: 9.5 (W), 3.7 (H), 9.4 (D), 13.2 lb
- 25 MHz - 799 MHz
900 MHz - 1999 MHz
- *25 MHz - 1999 MHz
- SSB, AM, FM, WFM
- TV Broadcasts
- Direct Keyboard Entry
- 900 Memory Channels
- 10 Memory Banks
- 20 Scan Edge Memories
- Built-in Clock
- Multiple Scans
- Window Scans
- Model R7100-02 for Government Sales (same price)

IC-R1



- Dimensions: 16.7 (W), 5.9 (H), 14.4 (D), 44.1 lb
- 100 kHz - 1.9 GHz
- SSB, AM, FM, WFM, CW
- Multi Function
- CRT Display
- High Frequency Stability
- Direct Keyboard Entry
- 1000 Memory Channels
- Memory Editor
- Dual Clocks
- AFC
- Multi Scan

IC-R71A

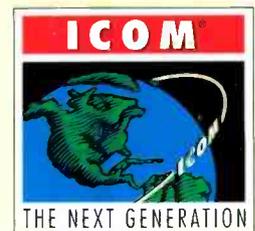


- Dimensions: 11.3 (W), 4.3 (H), 10.9 (D), 16.5 lb
- 100 kHz - 30 MHz
- SSB, CW, AM, FM and RTTY
- Superior RF Circuits
- Notch Filter
- Direct Frequency Entry
- 32 Memory Channels
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- Multiple Scanning
- Voice Synthesizer (opt)

GP22A



- Dimensions: 2.6 (W), 5.2 (H), 2.1 (D), 11.6 oz
- Parallel Receiver (1600 MHz)
- Superior 5 Channel Receive System
- 15 m RMS (GDOP 6), 2D RMS Position Accuracy
- Palm-size Portability
- Light-weight (11.6 oz including battery)
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* Under U.S. Code Provision SEC 2512 (2) restricted sales to the following: "(2) It shall not be unlawful under this section for -- (a) a provider of wire or electronic communication service, or an officer, agent, or employee of, or a person under contract with, such a provider, in the normal course of the business of providing that wire or electronic communication service, or (b) an officer, agent, or employee of, or a person under contract with, the United States, a State, or a political subdivision thereof, in the normal course of the activities of the United States, a State, or a political subdivision thereof, to send through the mail, send or carry in interstate or foreign commerce, or manufacture, assemble, possess, or sell any electronic, mechanical, or other device knowing or having reason to know that the design of such device renders it primarily useful for the purpose of the surreptitious interception of wire, oral, or electronic communications."