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Inside the House of the Blues

By Steve Douglass

The author (well-known to long-time MT readers and military monitors), takes us along on one of his favorite activities—witnessing breathtaking performance by the Blue Angels, the Navy's crack aeronautical demonstration team. The opportunity to view their practice run-through on press day meant he was able to check frequencies and program radios in advance of the show they put on for the public the next day.

There's no better lead-in to our aeronautical issue than to revisit this world-renowned team of ace pilots. Turn to page 8 for a taste of the excitement and their 1998 schedule, then program your scanner and head for the nearest airshow! Cover photo courtesy USN Blue Angels.

BeeWee in My Back Yard ........................................... 12

By Ronald Perron

Most people hate living close to a major airport, but for a scanner buff, it's nirvana. Baltimore Washington International (pronounced “BeeWee”) airport is host to a fascinating variety of civilian and military aircraft, and MT provides the frequencies to plug into your scanner for some good aero listening.

CIA vs. Saddam: The Radio War of the Nineties .......... 18

By Nick Grace

Whenever a military build-up draws world attention once again to this flash point in the Middle East, one can be sure that before weapons fire, the war of words is already well underway. The US has had an ongoing presence on the airwaves for years, though their tactics may change with administrations and political realities.

VORTAC Goes the Distance .................................... 22

By Michael Scofield

These low power, workhorse beacons used for aeronautical navigation get put to a novel use by our author. He issues a challenge and provides some education along the way. Oh say, how far can you see?

REVIEWS:

If you are wondering what the difference is between the BC235XLT TrunkTracker and Radio Shack's PRO-2050, turn to page 86 for the definitive answer by Bob Parnass. Shortwave listeners will find the first of a two-part, in-depth analysis of the Drake R8B by Larry Magne on page 88.

Page 90 carries John Catalano's promised review of the WiNRADiO Digital Suite. Turn to page 85 for reviews of two other useful accessories—the MFJ-418 Pocket Morse Code Tutor and the Opto Techtroyz Micro RF Detector.
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New addresses for the email hobby forums formerly hosted by GroveNet:

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Note: The Grove Enterprises internet address is changing. To find all your favorite pages follow the links from www.grove.net, or try the new address www.grove-ent.com to find the Monitoring Times web pages and updates on these email forums.

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WASHINGTON WHISPERS

By Fred Maia, W5YI
fmaia@internetMCI.com

FCC Agrees to Examine “Microstations”
Two Petitions Could Legalize “Pirate” Radio!

More than ever, the FCC has its hands full combating unauthorized “pirate” radio stations. But it recently granted a rulemaking number to a petition filed by Nickolaus E. Leggett, N3NL, of Reston, Virginia, seeking to create a “Microstation Radio Broadcasting Service.” If authorized, such a service could eliminate the need for illegal operation.

The FCC receives some 13,000 inquiries a year about low-power broadcasting. Nickolaus Leggett and his cosigners Judith Leggett and attorney Donald Schellhardt hope to expand availability of the airwaves beyond the limited existing opportunities. The FCC placed their petition on Public Notice on February 5, and granted it number RM-9208.

The petition proposes that one AM and one FM channel would be assigned to the entire licensed microstation service. Each station would be licensed to operate in a specific location. Transmitter output power would be limited to 1 W, with antennas limited to 50 feet above ground or building.

Licenses would be granted on a first-come, first-serve basis with random selection to be used “if the Commission is swamped with license applications.” Congress has forbidden the FCC to continue using random selection, or lotteries, to award station licenses, so federal law would probably have to change— not too likely given the lure of auction revenues.

As asked by Radio World, an industry newspaper, for his views on pirate broadcasting, FCC Chairman Kennard pointed out the trend of massive consolidation in the radio industry, with some companies seeking to buy hundreds of stations. He said that there is a need to create more outlets for expression, and that he is receptive to hearing more about licensing some form of low-power broadcasting. He has instructed the FCC’s Mass Media Bureau to look into whether it is possible to create a low-power radio service.

The FCC already has a “Low Power Radio Service” (LPRS) in the 216-217 MHz band. But the FCC has carefully limited it to certain obscure uses, such as transmissions for the hearing impaired, a broad category of short range “health care assistance devices” and anti-theft beacons. LPRS is legally a form of CB Radio and may not be used for broadcasting to the public. LPRS is not an unlicensed operation, instead devices are “authorized by rule” (i.e. no license documents are issued).

Low Power Microradio Broadcasting Service

Rodger Skinner, of Pompano Beach, Florida, has also filed a petition with the FCC looking towards creating a Low Power FM broadcasting service. Skinner is president of TRA Communications Consultants, Inc. and also an Extra Class amateur, W4FM. The Commission has accepted the February 20th Petition for Rulemaking.

Skinner has worked in broadcasting since 1963 actually longer if you count the mini-station in his basement at age 16. He started his own consulting business in 1976 after working as a Top-40 DJ and engineer at about a dozen AM/FM radio stations. He now makes his living filing FM and LPTV applications for clients and also owns a low power TV station in Fort Lauderdale, Florida.

“I have been working on my LPFM petition for almost two years,” Rodger told us. “I have always wanted to own a radio station, but like most I have not been able to afford to buy one. The 100 kW FMs here now are going for $50 million.”

Skinner says that four distinct types of Low Power FM service are needed throughout the country. First is for the hobbyist who wishes merely to transmit a signal to another part of his/her house or other needs. This is already adequately provided for under current Part-15 rules, which limit radiation to 250 uV/m at 3 meters from the antenna.

Secondly, there is a need for “special-event” stations to broadcast information concerning a special event such as a boating regatta or auto race for a limited time period. These stations may only need to broadcast for a weekend or a few days related to the event in question. There should be a streamlined system to coordinate these one-time requests, where coverage requirements might typically be one to two miles, around a park, racetrack, etc. Skinner refers to these as “LPFM-3 Special Event” permits.

A third type of station is needed to serve small areas within larger communities, such as are operated today by some so-called “pirates” with a typical range of under five miles. Many in this group will prefer to operate with volunteers from the community offering a variety of programs and viewpoints by area residents and offer a loosely structured form of broadcasting, often without set hours of operation.

This LPFM-2 class station could be started at little cost. The station would have a maximum power limit of 50 watts (ERP), a minimum power limit of 1-watt (ERP) and maximum antenna height of 150 feet.

Finally, Skinner believes there is a need for a more structured type of station, again with local owners, who themselves will invest the time and money needed to create a station that will be responsive to local needs and interests. LPFM-1 stations will be the highest class with the largest possible coverage area as well as the most stringent requirements.

This type of station will mirror more closely the typical full-power station, may consist of a few employees in addition to the owner(s) and have a 24-hour per day continuous broadcast schedule. A minimum power level of 50 watts (ERP) and a maximum power level of up to 3 kilowatts (ERP) will provide a coverage area of up to about fifteen miles, similar to the old Class A FM stations.

LPFM would utilize commercial FM channels 221 (92.1 MHz) through 300 (107.9 MHz) with sufficient channels available to provide one or more new channels to each market area. Applications for the temporary special-event LPFM-3 stations could be handled by volunteer frequency coordinators so that interference is not caused to existing stations.

The petition for LPFM is online for reading or downloading from: <http://www.concentric.net/~radiofv>. Rodger Skinner’s e-mail address is: radiofv@cris.com.
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The world’s most surprising communications receiver just got the world’s most surprising add-on.
HR2369 Passes the House

As anticipated, the cellular protection bill H.R. 2369 came to a vote and passed the House with one dissenting voice in early March. The Bill now moves to the Senate Commerce Committee for further action. See this month’s “Scanning Report” for all the details.

Lost in the clouds

A twin-engine plane flown by pilot Tom Cleary drifted 150 miles over the Atlantic on its way from Rochester bound for Newark, New Jersey. Above the clouds at 9,000 feet and with direction-finding and communications equipment knocked out due to electrical failure, the pilot was completely lost.

When the plane came up missing, air traffic controllers contacted the US Coast Guard. Two F-16s caught up with the plane and one signalled for failurures and flashing his afterburners, said Lt. Col. John Dwyer. Once within 60 miles of the coast, two F-15s took over and escorted him to Atlantic City International Airport.

“He was real happy to be back, real happy to be alive,” said Dwyer.

Clue: on a plane, by unknown passenger, with a cellphone

Reports forwarded to us by email claim that a recent crash by a China Airlines A300 may be blamed upon interference from a cellular phone. According to the correspondent Tsung-Hsien, “the [Chinese] government has announced a new rule which can send anyone making cellular phone calls on an airplane to prison up to five years. If an accident is caused by the phone call, the penalty can go up to a life sentence.”

Many US airlines recommend passengers switch off their phones, but how many recognize the difference between switching off the phone and just not talking on it? And did the cellphone really do it?

FAA says cell site needs paint

In the search for existing structures on which to erect cellular antennas, Cellular One thought they had a good deal going; they would paint and restore a rusty old water tower and remove a second dilapidated tower. In return they would negotiate a bargain price on renting the tower to support their antennas.

Now the FAA says the water tower (which predated FAA safety regulations) is close to a lavish to the Schenectady, NY, county airport that it may have to be painted with an orange and white checkerboard instead of the tasteful sea green and gray that had been planned. So much for cellsite stealth and good community relations!

Tower Space for Rent

One type of structure previously dismissed as a potential host to PCS and cellular antennas is the AM broadcast tower. As explained in last month’s cover story, the tower is “hot” with RF energy, since the tower is the antenna.

However, consultants from Lawrence Behr Associates, Inc. (LBA), based in Greenville, NC, have announced a new proprietary conversion adaptation of these AM towers to

---

**COMMUNICATIONS**

“Well, I’d better get off the cell phone, Margaret. We seem to be coming in for a landing...”

---

**BULLETIN BOARD**

May 3: Hagerstown, MD
Great Hagerstown Hamfest at Hagerstown Junior College, Exit 32B off I-70 to Edgewood Drive, right at Home Federal Bank, Contact Don Jones KB8WHW 304-728-7769. VE exams 9 a.m. (no charge, walk-ins accepted but preregistration requested) and seminars. Talk-in 147.090-8a.m. to 3p.m., $5 admission. Food, prizes, indoor facility and tailgating.

May 15-17: Dayton, Ohio
Dayton Hamvention at Hara Arena. Come see Grove Enterprises/MT/ST and see a live demo of the latest WiNRADIO®, booth #573 / #591.

May 30: Loveland, CO
Superfest Swapmeet sponsored by Northern Colorado ARC at Larimer County Fairgrounds, 700 S. Railroad. Contact Michael Robinson N7MR, 970-282-1167 for info. Free parking; commercial exhibitors, refreshments, VE session. Talk-in 145.115-100Hz, 146.52-8a.m.-3p.m., $3 admission.

June 7: Butler, PA
44th Breezeshooters’ Hamfest (largest in western PA) at the Butler Farm Show grounds, north of Butler (PA Rt 68 East from I-79). Contact Bob Ferrey Jr. N3DOK 712-367-2393 or see http://www.users.sgi.net/~wolfie/ for info. Talk-in 147.96/36. $5 admission.

June 7: Queens, NY
Hall of Science ARC Hamfest held at the NY Hall of Science parking lot, Flushing Meadow Corona Park. 47-01 111th St. Contact Stephen Greenbaum WB2KDG 718-898-5599, WB2KDH@bigfoot.com. Free parking; prizes, food. 9a.m. - 3p.m. $5 donation. Talk-in 444.200+ PL 136.5.

New web sites:
don’t violate the mandates of the 1996 Telecommunications Act.

Vermont is even attempting to mount a challenge to the Telecommunications Act. Vermont Sens. Patrick Leahy and James Jeffords and Rep. Bernard Sanders are sponsoring legislation (S 1350 and HR3016) that would return the power to the towns.

Is your township prepared? You'll only be allowed a limited amount of time to place a moratorium on new construction while your township, county, or state addresses the question. Waiting until the cellsites begin to sprout up may be too late!

Shaking out the digital bugs

The nation’s first high definition television (HDTV) broadcast was a real heartstopper—literally! WFAA-TV in Dallas beat all other US stations to the punch when it put its newly received Harris transmitter on air February 27th. It was also the first to encounter a unique interference problem.

At Baylor University Medical Center, several of its 60 wireless heart monitors stopped sending data. Late that evening, the hospital thought it had the problem fixed, only to have it start all over again the next day. Steve Juett, senior clinical engineer, knew the low-power, unlicensed heart monitors used frequencies allocated to TV channels 7 and 9. As soon as a colleague mentioned WFAA’s inauguration of digital TV on channel 9, he had the answer.

"It was very clear to me what was going on," Juett said. When WFAA’s transmissions stopped at night, so did the problems with the monitors.

Baylor has decided to purchase a new monitoring system, but, meanwhile, WFAA is concerned about educating other engineers about this unforeseen side effect of a mode customers can’t even see yet—since no major manufacturer will be selling TVs that can pick up the digital signal until this fall.

Communications is compiled by Rachel Bagnih with help from this month’s reporting team: Anonymous, New York; David Alpert, New Jersey; Roy Beavers, e-mail: Jean Foley, email; Wm. Hearty, Ohio; Steve Kaat, Michigan; Maryanne Kehoe, Georgia; Kevin Klein, Wisconsin; Sergey Kolesov, Ukraine; Kenneth Lensing, Arizona; Claudio Morales, Argentina via Larry Van Horn, Dale Newton, VT; Ryan, Long Island; Bob Mills, California; Doug Robertson, California; Richard Sklar, Washington. We welcome clippings from your world of radio: send to MT headquarters or email mteditor@grove.net.

This spring more will be pushing up than just daisies

Every “stealth” solution to the coming cellular/PCS/HDTV tower explosion is a help, even if it's a drop in the bucket compared to the number of sites needed. Communities and even states are beginning to wake up to the need to establish site guidelines, and fast!

We have received news clippings and email from Arizona, Massachusetts, New Hampshire, New York. North Carolina, Vermont, and Washington regarding communities making a concerted effort to hammer out tower laws. Town boards are struggling to compose ordinances which match the desires of the neighborhood with the interests of the cellphone companies (which now receive rights similar to public utilities), and which
The Blues’ close formations are born of combat maneuvers, but performed tighter and nearer the ground than any standard exercise.

Liberal, Kansas, is flatter than the proverbial pancake. In fact, Liberal is famous for pancakes. Each year they hold a pancake race right down the middle of main street. Lovely maidens brandishing skillets, flipping flapjacks and galloping for all they’re worth is a major tourist draw, but that is not why we are here.

My monitoring buddy Frank Murphy and myself have made the trek from our home in Amarillo due north to Liberal to meet the Blues.

Today is press day at the Liberal Air Museum. Tomorrow the annual Mid-America Airshow 97 kicks off. Frank Murphy, a photographer for an Amarillo television station, is here to shoot some video for the local news. Naturally, when I heard of his assignment I boldly invited myself along.

I wasn’t about to miss out on an exclusive private airshow put on for the members of the media and airshow staff by the Navy’s Blue Angels Flight Demonstration Team. It would be an excellent chance to see the Blues in action and also monitor the exciting military communications involved in putting this top team in the air.

I brought along with me on this trip my trusty PRO-43 and my new Bearcat TrunkTracker. Although this new gee-whiz scanner is great at intercepting those hard to follow trunked systems, today we will be using it to search out the VHF air bands for airshow action. The PRO-43 will be tasked with scanning the UHF military frequencies for the Blues air to air communications.

The Liberal Air Museum is quite a thing to see. Who’d have thought that in the middle of the corn belt one would find such an excellent aviation museum? The displays are first rate. Hanging from the rafters inside the main museum is one of my favorite aircraft, the F-
104 Starfighter. This 60s era superplane was the product of the amazing Skunk Works engineers and would lead to a new generation of secret spyplanes such as the U-2/TR-1 Dragonlady, SR-71 Blackbird and the F-117 stealth fighter.

As much as we wanted to linger and gawk at the museum displays, we had an appointment to keep with the Blue Angels. The distinct sound of an F/A-18 warming up drew us away from the fascinating yet very static displays. I promised myself that when we returned the following day for the airshow I would spend more time in this museum.

**The Hornets**

Outside, the beautiful blue and yellow F/A-18 Hornets glisten in the bright Kansas sunlight, but make no mistake: these glitzy showbirds can be transformed into warbirds in short order.

The F/A-18 is now the primary fighter/attack aircraft in use by the U.S. Navy. An improved version called the F/A-18E Super Hornet will be protecting carrier battle groups well into the next century. Although the Super Hornet is faster, stealthier and billed as more lethal than the F/A-18 the Blue Angels fly, looking at these stunning ambassadors in blue warming up on the tarmac it's hard to think they could ever become obsolete.

**Best of the Best**

It goes without saying to be a Blue Angel pilot you have to be better than good. To qualify to become one of the best of the best you must have thousands of hours in tactical fighter aircraft. You have to be able to take off and land on the rolling deck of an aircraft carrier on the stormiest of nights and the dreariest of days.

Maverick, loner "Tom Cruise" types need not apply. No hot shots here. The precision maneuvers of the Blue Angels call for teamwork and tons of trust.

**Home and History of the Blues**

Formed in 1946 in response to the Navy's need to promote naval aviation, the Blue Angels soon became the premier military flight demonstration team.

Home is Naval Air Station Pensacola, but the Blues are found there less than half the time. The Blue Angels fly six days a week, 300 days a year either preparing for or performing in airshows across America and the world. In the off season you'll find the blues training at their winter camp at Naval Air Facility El Centro, California.

Eight sleek F/A-18 and a chubby C-130 Hercules make up the Blue Angel's flight team. The team is backed by the Navy's best maintenance and support crews. All work as an well-honed integrated team to keep the Blues the best in the modern skies.

Although Frank, myself and a small band of museum workers were the only ones on hand to witness the Blue Angels practice show, they carried it off as if there were thousands in attendance.

Everything, from the ground crewmen removing the wheel chocks to the F-18s taxiing out, is done in perfect synchronization reflecting the dedication of all members of the team.

**Showtime**

The engines spool up and the jets taxi out to the active runway, the pilots giving their ground crewmen a jaunty salute for a job well done.

For the next forty-five minutes we were treated to an amazing exhibition of military air power.

Like homesick angels the Blues streak up into the deep blue with astonishing speed, power and grace. Rolls and loops thrill our eyes and afterburners shake us to the marrow. To borrow a well-known Navy aeronautical phrase, both Frank and I are "glad to be here."

The Blue Angels Flight Demonstration
Team is made up of eight aircraft. Each has an important role.
In aircraft number one is the flight leader and commander of the Blue Angels, otherwise known as the Boss.
In aircraft number two is the right wing pilot—his position in the Diamond Four formation.
Just opposite him in aircraft number three is the left wing pilot.
The slot pilot in aircraft number four has to be good. He flies in the precarious position below and behind the diamond four, constantly pushed around by the wake of the six powerful jets flying just feet away from his cockpit canopy.
In Hornet number five is the lead solo. Lead and the opposing solo, in jet number six, perform the eye-popping “cross over break” maneuver where the jets appear to almost collide with each other.
The most difficult maneuver for the two opposing solos is the “Tuckover Roll.” The two aircraft start to the right of the airshow crowd, flying in tight formation inverted at 150 feet off the ground and traveling at 450 miles per hour. Just prior to the center of the crowd the lead solo will make a short radio call, “ready ... hit it.” At that moment both aircraft perform a maximum stick deflection roll to the left without seeing each other. If either pilot is late, they will collide. Talk about blind trust!

More Than Just Fancy Flying

Although the flying is graceful and beautiful to watch, it is born of military necessity. The maneuvers are the same used by jet aces in military combat, compressed, refined and brought down to an altitude that lets us poor groundlings observe.

For example, the Blues take the standard tactic of formation flying, bring the aircraft closer together (to within a heart-stopping three feet) and down to a hundred feet over airshow center. With no room for mistakes, the diamond four loops, rolls and charges through classic air combat maneuvers that would make even the best hot dog pilots stop to admire.

To achieve this type of flying precision the Blues, practice, critique, practice, critique and practice again.

Zen and the Art of Flight

Before every show the Blues meet for a ritual that to the layman might seem a bit strange. Seated around a large table the pilots sit, most of them with their eyes closed. Some are scrutinizing aerial photos of the area. All are locked in a trance-like state visualizing the airshow routine while the boss calls out flying cues as if talking on an invisible radio. The pilots hold invisible make-believe throttles in their hands and make small movements, flying the maneuvers in their heads.
The calls sound like a strange enchanted military mantra, “easing power... smoke on... a hit... tail... more pull... ready boards... boards.”

This previsualization session helps the Blues practice the cadence, rhythm and flow of the airshow routine without ever leaving the ground. It becomes as automatic as breathing or more like a well-rehearsed dance routine, a jet-powered ballet among the clouds.

Attending one of these practice sessions
also helps military monitors understand the cryptic radio calls they will intercept.

II Monitoring the Blues

Monitoring the Blues adds a new dimension of enjoyment to the demonstration. After searching out the Blue Angels frequencies and programming them into my PRO-43 I found the best technique is to monitor the Boss's calls on headphones. This helps shut out some of the confusing ambient noise around you and helps you hear the quick staccato calls over jet noise.

We found the Blue Angels' Boss transmitting on 307.700 MHz and the opposing solo on 391.100. Ground support and maintenance used the following frequencies: 142.025, 143.600, 142.625 and 143.600 MHz. Airshow Control could be found coordinating airshow acts on 123.100 MHz.

Other Liberal area military aviation related communications were uncovered as well on the following Kansas City Center frequencies: 324.100, 319.000, 379.200, 290.800, 281.400, 387.100, 133.200, 125.200, 134.000, 132.100 and 132.200 MHz.

We also were treated to a parachute drop by the U.S. Army's Golden Knights. The Golden Knights relayed wind speeds and drop instructions to their C-130 on 123.425 while their maintenance details could be found using 42.350 MHz.

In contrast to our exclusive private airshow, the next day we found ourselves on the flight line among twenty thousand rabid airshow fans, but the show was no less exciting. Our preshow-show had helped us prepare as much as the Blues. Armed with our scanners, the right frequencies, cameras and binoculars we wouldn't be distracted from enjoying the Blues by searching for active frequencies.

I lugged my gear to the flight line: a lawn chair, scanners and a portable Walkman style CD player. I had wired my headphones to be able to hear the Blues communications on the PRO-43 as well as my personal soundtrack that would play through the CD player. You may laugh, but as the Blues began to taxi I started the music—the soundtrack from Crim- son Tide that I knew would fit their flying style like it was composed just for them.

As the Blues took to the skies, so did my thoughts, propelled to great heights by the music and the crystal clear voice of the Boss reciting the calls and cadence that coordinated the great flashing blue and yellow Hornets.

For just a split second I could imagine the G-forces pressing down on my body as the lead solo called for the Tuckover Roll. For a brief moment in time, I was a Blue Angel.

### BLUE ANGELS 1998 PERFORMANCE SCHEDULE

**APRIL:**
- 25-26 NAS Norfolk, VA, Air Show

**MAY:**
- 2-3 Ft. Lauderdale, FL, Intl. Air and Sea Show
- 9-10 Chattanooga, TN, Air Show
- 16-17 Andrews AFB, MD, DoD Open House
- 20 USAF Annapolis MD, Air Show
- 22 USAF Graduation Fly-By
- 24 NAS Meridian, MS, Air Show
- 30-31 NAS JRB Ft. Worth, TX, Air Show

**JUNE:**
- 6-7 Coney Island, NY, Air Show
- 13-14 Eau Claire, WI, Air Show
- 20-21 Grissom ARB, IN, Air Show
- 27-28 Niagara Fall ARS, NY, Thunder over Niagara

**JULY:**
- 4-5 Traverse City, MI, Cherry Festival
- 11 Pensacola Beach, FL, Air Show
- 18-19 Dayton, OH, Air Show
- 25-26 Latrobe, PA, Air Show

**AUGUST:**
- 1/2 Hanscom AFB, MA, Air Show
- 8-9 Seattle, WA, Seafair Air Show
- 14-16 MCAS Miramar, CA, Air Show
- 22-23 Chicago, IL, Air-Water Show
- 29-30 Offutt AFB, NE, Open House

**SEPTEMBER:**
- 5-7 Chesterfield, MO, St. Louis County Air Show
- 12-13 Halifax, Canada Nova Scotia Air Show
- 19-20 Warner Robbins AFB, GA, Open House
- 26-27 Reading, PA, Redding Aeroeast

**OCTOBER:**
- 3-4 Stockton, CA, Air Show
- 10-11 San Francisco, CA, Fleet Week
- 17-18 Houston, TX, Air Show
- 24-25 NAS Jacksonville, FL, Open House
- 31-10/1 NAS New Orleans, LA, Air Show

**NOVEMBER:**
- FL, Open House HOMECOMING

### THUNDERBIRDS 1998 SCHEDULE

**APRIL:**
- 25-26 Point Mugu NAWNS, CA, Air Show

**MAY:**
- 2-3 Knoxville, TN, Air Show
- 9-10 San Angelo, Texas, Air Fiesta
- 16-17 Fairchild AFB, WA, Aerospace Day
- 23 Kelly AFB, TX, Air Show
- 27 Air Force Academy, CO, Graduation
- 30 Elmendorf AFB, AK, Open House
- 31 Eielson AFB, AK, Open House

**JUNE:**
- 6-7 N. Kingstown, RI, Air Show
- 13-14 Portland, OR, Rose Festival Air Show
- 20-21 Santa Fe, NM, Air Show
- 27-28 Davenport, IN, Air Show

**JULY:**
- 4-5 Battle Creek, MI, Air Show
- 11-12 Pittsburgh AFB, NY, Air Show
- 18 NAS Whidbey Island, WA, Sea 'N' Sky Fest
- 22 Cheyenne, WY, Air Show
- 25-26 Selfridge ANGB, MI, Air Show

**AUGUST:**
- 1/2 Vandenberg AFB, CA, Air and Space Show
- 8-9 Abbotsford, Canada, Air Show
- 15-16 Big Rocks, NY, Wings of Eagles Air Show
- 29 Minot AFB, ND, Open House
- 30 Grand Forks AFB, ND, Open House

**SEPTEMBER:**
- 5-7 Cleveland, OH, Air Show
- 12-13 Westover ARB, MA, Open House
- 19-20 Durango, CO, Air Show
- 26-27 Salinas, CA, Air Show

**OCTOBER:**
- 3-4 Sioux City, IA, Mid-America Air Show
- 10-11 El Paso, TX, Amigo Air Show
- 17-18 Muskogee, OK, Air Show
- 24 Columbus AFB, MS, Open House
- 25g Little Rock AFB, AR, Air Show

**NOVEMBER:**
- 31-Oct)-1 Victorville, CA, George Air Show
- 7-8 Lake Charles, LA, Air Show
- 14-15 Lake City, FL, Air Show

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**U.S. Army Golden Knights.**

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For some people, living near a major metropolitan airport is a real pain. However, for an aviation and scanner buff like myself it's like being thrown into the briar patch.

I live about six miles from Baltimore-Washington International (BWI) Airport — “Bee Wee” as it's sometimes pronounced on the air. My house lies in between the approaches to runways 33 Right/33 Left. The location gives me the best of both worlds. I can hear both the aircraft and the controllers and then go out in my backyard and watch the aircraft.

I've always been interested in aviation and did some real-life “scanning” when I served in Uncle Sam’s Air Force. I recently decided to get into the hobby after reading a copy of Monitoring Times and browsing an internet site on military communications. I bought a Radio Shack PRO-2045 and linked that up to a D-130J discone up in my attic.

Boy, does my equipment ever get a work out. BWI is one of the busiest airports in the Middle Atlantic area. Karen Black of the Airport’s Information Office says that in 1997 there were more than 266,000 take offs and landings. That compares favorably with totals from the other major airports in the area, Dulles International and Washington National. That total is certainly going to increase as major improvements are made to handle more airlines and passengers.

At the present time nineteen different scheduled airlines, both domestic and for-
eign, operate from BWI. They run the gamut from the standard U.S. carriers US AIR, United, Southwest, etc. to foreign carriers such as Air Aruba, British Airways, El Al, Icelandair and Mexicana.

Starting in April of this year, the U.S. Air Mobility Command will use BWI to service various military locations in Europe. Using contract commercial carriers such as Air Transport International, American Trans Air and World Airways, AMC passenger operations from BWI are expected to grow to more than 20 flights per week.

The AMC and the foreign carriers are tenants in the newly opened (December 1997) International Terminal. This new addition will double BWI's current international passenger capacity. Eventually, the terminal will expand to a total of 15 gates as usage increases.

In addition to the passenger side of things there is a bustling cargo operation served by all the major bulk carriers. Emory Air Freight, DHL, UPS, and FedEx are among the many users. Last year more than 255,000,000 pounds of freight was handled by the cargo terminal.

BWI's handy location about halfway between Baltimore and Washington, DC, makes it a natural for executive and business travel. The General Aviation Executive Terminal, operated by Signature Flight Support, is open 24 hours a day, seven days a week. So there's a never-ending parade of corporate and general aviation aircraft and helicopters to tune into.

There's a bonus for us sports fans, too. The cargo terminal plays host to the charter aircraft used by several baseball and football teams as they visit Baltimore to play the Orioles and the Ravens.

So if you're interested in commercial aviation there's a wide variety of domestic and foreign commercial aircraft to whet your appetite. BWI is really user-friendly in this regard. There's a specially constructed observation deck at the domestic terminal that lets you enjoy a fine meal and a beverage and also see the aircraft close up and watch the take-offs.

BeeWee's modern new terminal doubles its international passenger capacity.
and landings from a warm, dry area with cushioned seats.

For hardier folks, the airport has constructed a large open observation/parking area at the end of runway 33. When the weather is nice, it's common to see families there enjoying a warm evening watching the aircraft take off and land. Many of the on-lookers are also carrying their portable scanners to enhance their enjoyment.

Federal, Military, and VIP Hub

For those like myself interested in military flight activity, BWI is a convenient traffic hub. Patuxent Naval Test Center, Dover Air Force Base, Andrews Air Force Base, several Army airfields, as well as the home bases of the Maryland, Pennsylvania, West Virginia and Delaware Air National Guards are all located within 100 miles of BWI. This dense military flight training and operations environment provides lots of opportunities for some very interesting sightings and visual sightings as their aircraft land at or transit the BWI control areas.

Probably some of the most unique are the periodic visits by the desert-camouflaged C-130s of the Egyptian and Saudi Arabian Air Forces. Several times a year they fly in to pick up avionics and other electronic equipment for their F-16s and AWACS aircraft. This equipment is produced at the Northrup-Grumman plant located on the edge of the airport. It's quite a sight to see these distinctive aircraft parked at the outer edge of the airfield in plain view. I've even seen one or two civilian Saudi Arabian (Saudia) aircraft and a commercially registered IL-76 parked here.

Since BWI is only about 40 miles from Andrews Air Force Base, there are regular visits by aircraft from units based there. These visits are highlighted by the Presidential VC-25s (SAM 28000 and SAM 29000) practicing touch and go and approaches. The airport is one of the alternate fields for these aircraft should they have to divert from Andrews, so the pilots must periodically familiarize themselves with the airfield area. I also assume that training for any new pilot or co-pilot assigned to the Presidential unit includes trips to BWI.

Other Andrews aircraft that I've noted "visiting" BWI are the non-presidential Special Air Mission (SAM) Gulfstreams (callsign Venus) of the 89th Air Wing; EA-6Bs (callsign Cobra) from VAQ-209 at the Naval Air Facility; and F-16s (callsign Combat) from the DC Air National Guard's 113th Fighter Wing. I believe that all of these visits are for aircrew airfield familiarization and flight proficiency training.

The airport also gets a fair share of visits from Priority Air Transport (PAT), Joint Operational Support Aviation (JOSA) and AMC's Reach aircraft. For me there's nothing quite like the thrill of listening to a Reach "heavy" aircraft working with a BWI controller and then going out on my deck and watching a C-141 or C-5 fly over the house on its way into the airport. For me that's what scanning is all about.

The Maryland Air National Guard's 175th Wing, based at Martin State Airport just a few miles northeast of Baltimore, also uses BWI for training. Their A-10s (callsign Raven) and C-130s (callsign Witch) are routinely noted using BWI airspace and controllers. The A-10s usually transit BWI airspace to/from Martin State on their way to special training areas near Patuxent Naval Air Station or near Willow Grove, Pennsylvania, while the C-130s use the local airspace for navigational flight training. EC-130s from the Pennsylvania Air Guard's 193rd Special Operations Group (callsign Baton) from Harrisburg Airport also use BWI facilities for flight training.

NASA's Headquarters are only about 20 miles down the road in Greenbelt. There are periodic visits by various NASA aircraft into and out of BWI; especially when there is activity at NASA's Wallops Island Flight Facility which is located on the Virginia seashore, not far from the Baltimore-Washington area.

Other interesting local users are some of the area's law enforcement units. The Maryland State Police Aviation Unit (callsign Trooper) operates eleven Aerospatiale SA-365N helicopters used for search and rescue, medical evacuation and police search duties. They are based at Martin State Airport but are regularly heard operating with BWI controllers. The Anne Arundel County Police Department also operates aircraft out of the General Aviation Terminal.

No, you won't find me complaining about living so close to a major airport: Just when I think it's another routine logging day, up pops a Saudi, Egyptian, NASA or unusual civil aircraft to make things interesting. With BWI almost in my backyard there's never a dull scanning moment.
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www.americanradiohistory.com
To tune in to Baltimore Washington International activity, following are the most current frequencies (all in MHz):

**Aircraft Frequencies**

- **UNICOM:** 122.95
- **ATIS:** 115.1 127.8
- **FSS:** 122.1 122.2
- **GROUND:** 121.5 120.2
- **TOWER:** 119.4 120.2
- **APPROACH:** 119.0 (020-100 Degrees) 119.7 (131-180 Degrees)

**DEPARTURE:**
- 124.55 (101-130 Degrees)
- 128.7 (181-019 Degrees)
- 228.4 (020-100 Degrees)
- 307.9 (181-019 Degrees)
- 325.8 (101-130 Degrees)
- 287.1

**CLEARANCE:**
- 118.05

**AS ASSIGNED:** 325.8

**CLASS B:**
- 119.0 (020-100 Degrees)
- 124.55 (101-130 Degrees)
- 128.7 (181-019 Degrees)
- 228.4 (020-100 Degrees)
- 307.9 (181-019 Degrees)
- 325.8 (101-130 Degrees)

**CLASS B IC:**
- 119.7 (131-180 Degrees)
- 231.6 (131-180 Degrees)

In addition to those above, I’ve also noted the following unlisted air frequencies used by BWI controllers: 125.525/254.3/265.4/281.6/286.2/304.1/

The Maryland Air National Guard A-10’s at nearby Martin State Airport use UHF tower (257.8) and approach (228.4) when working with BWI, while the ANG C-130’s use the normal VHF frequencies. BWI provides approach and departure services for these aircraft since Martin State is so close.

The Maryland State Police helicopters generally work on the established tower/approach frequencies. They use 44.74 and 47.66 when communicating with the Medevac System Command control and with State Police road units.

The Anne Arundel County Police aircraft use standard VHF radios to communicate with the airport controllers. However, they use their Motorola 800 MHz trunked hand-held radios when communicating with police road units.

**AIRLINE GROUND OPERATIONS FREQUENCIES**

- American 129.225
- Continental (Maintenance) 129.250
- United 129.300
- US Air 130.100
- Northwest 130.350
- Continental 130.400
- United 131.075
- Continental (Operations) 131.225
- Northwest 131.750
- Delta 131.850

**OTHER AIRPORT FREQUENCIES OF INTEREST:**

- Administration Operations 453.8
- America West 464.60
- Butler Aviation 462.1125
- Continental Airlines 460.700/460.750/460.875
- Delta Airlines 460.675/460.750 460.825/460.850
- Henson Aviation, Inc. 463.2625
- Icelandair 462.1625
- Northwest Airlines 460.650
- Trans World Airlines 460.675
- US Air 460.700
- United Airlines 460.725
- American Airlines 461.7875/461.9375 462.8375/463.8375 464.1125/464.6125
- Allied Aviation Fuel 151.850
- Allied Aviation Fuel 151.850

Aeronautical Radio Inc. (ARINC) operates an 800 MHz trunked system which provides administrative communications support to various airport entities.

**NON-AIRCRAFT FREQUENCIES**

- Dept. of Transportation Police 453.90
- Airport Fire/Rescue 154.10/154.98

**NOTE:** Maryland State Police from the nearby Glen Burnie Barracks (39.04 MHz) and Anne Arundel County Police and Fire (trunked 800 MHz) unit also respond to airport emergencies.
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By Nick Grace

Clandestine radio is a tool that governments use to wage a psychological war against other nations. Sometimes it works, sometimes it doesn't. The United States regularly employs this tactic both to support covert paramilitary operations, such as the 1954 Guatemalan revolution coordinated by the Central Intelligence Agency (CIA), and overt military intervention, including the 1994 campaign in Haiti.

Since 1990, the US has waged a war with broadcasts against Iraqi president Saddam Hussein. For DXers and clandestine radio enthusiasts, this has been a dynamic time full of mystery, intrigue, and excitement. Until now there had been more questions than answers.

The Gulf War

Saddam, bold after his victory over neighboring Iran, ruthlessly invaded Kuwait on August 2, 1990, prompting American president George Bush to take decisive action. At stake was the world's oil supply and regional stability in the Middle East. Before the bombing began, Bush and his advisers ordered the CIA and US military into action. These soldiers weren't armed with bullets, however. They were armed with a plane and a radio station: The Voice of the Gulf.

The Voice of the Gulf premiered on Thanksgiving Day 1990 on medium wave aboard the Pennsylvania Air National Guard's EC-130 aircraft dubbed "Command Solo." Before the plane and station took to the air, however, the CIA along with the Army's 4th Psychological Operations Group quickly organized a group of Kuwaiti exiles and Saudi intelligence officers to produce programming. Shows were recorded from a studio in Riyadh and sent via satellite to Command Solo once it arrived in Saudi Arabia. [1]

The Voice of the Gulf's purpose was twofold. First, it aired broadcasts to undermine Pennsylvania Air National Guard's EC-130 aircraft dubbed "Command Solo." Before the plane and station took to the air, however, the CIA along with the Army's 4th Psychological Operations Group quickly organized a group of Kuwaiti exiles and Saudi intelligence officers to produce programming. Shows were recorded from a studio in Riyadh and sent via satellite to Command Solo once it arrived in Saudi Arabia. [1]

"Time is up!" This was one of many leaflets dropped over Kuwait by the CIA to ensure that the Voice of the Gulf programs were having an effect. Hundreds of thousands of Iraqi soldiers surrendered or fled into Iran. (Photo courtesy of Central Intelligence Agency)
the commitment of the Iraqi troops occupying Kuwait by offering medical care and food. Covert air drops of propaganda leaflets warning Saddam's troops the war of propaganda continued — taking a very interesting turn.

The CIA, a PR Firm, and a Clandestine

Later that year, George Bush signed a Presidential Finding ordering the CIA to build an effective opposition group in Iraq that could replace Saddam's regime with a democratic government. With Saddam boxed in by the internationally sanctioned "No Fly Zone" safe havens to protect the Kurds in the north and the Shi'ites in the south, CIA officers scouted the area for Iraqis who could make such an opposition group a reality. They soon found Ahmad Chalabi, an Arab Shi'ite banker with good connections among Iraqi Shi'ites, dissident Sunnis and armed Kurds. Chalabi, they felt, could do the impossible: unite Iraqis under one umbrella.

With a potential leader already recruited, the CIA turned to a renowned public relations firm in Washington, DC, to design and "market" this organization. The Rendon Group was no stranger to this. In fact, this firm had been hired by intelligence officials to spin the public image of the 1989 American invasion of Panama.

Among the first things the Rendon Group did was to give a name to the Iraqi opposition: the Iraqi National Congress (INC). Providing a voice for the INC was also accomplished: The Iraqi Broadcasting Corporation. Internal budget documents within the firm released to the media last year show that nearly $24 million was spent on INC propaganda between 1991 and 1992, including costs of the radio station.[3] During its inaugural broadcast on February 15, 1991, the station aired George Bush calling for, in his words, "the Iraqi military and the Iraqi people to take matters into their own hands and force Saddam Hussein, the dictator, to step aside."[4] His speech echoed through Iraq and bolstered

Iraqi National Congress

The Iraqi National Congress' clandestine built with US taxes, the Iraqi Broadcasting Corporation (Sawt al-Shab al-Iraqi), is audible in North America on 9568.5 kHz at 2030 UTC and in Europe at 1030 UTC. Although a QSL has never been received by the station, reports can be mailed to the INC headquarters in London: 9 Pall Mall Deposito, 124-128 Barlby Road, London W10 6BL, UK. You can visit the INC's homepage, which contains information about this station as well as their slant on current developments: http://www.inc.org.uk/

confident that the INC was the group which could change the nation's future. The INC's clandestine station broadcast from both its own facilities in northern Iraq and US government transmitters in Kuwait on MW and shortwave frequencies.[5] Additional transmitters were set up in Jeddah, Saudi Arabia, Amman, Jordan, and Cairo, Egypt, with the assistance of various intelligence agencies.[6] From 1992 until American support for the group ended in 1995, the Bush and Clinton administrations sent $4 million annually to keep the station operational "so the CIA could have an Iraqi outlet for the anti-Saddam Hussein propaganda they had spent all that other money on."[7]

The Clinton administration, playing partisan politics and losing patience with the INC, lost its confidence with the group in 1995. A covert paramilitary operation was planned for the INC to attack a number of cities in Iraqi Kurdistan, but within hours of its start National Security Adviser Tony Lake cabled Chalabi with the words "You are on your own." The INC and two major Kurdish groups followed through with the operation but were finally decimated by Saddam's forces. The Iraqi Broadcasting Corporation was quickly yanked off of the transmitters in Kuwait, but eventually resumed broadcasts from a site in northern Iraq.

Evidence of the IBC's effectiveness is well known. According to Chalabi, "Through INC broadcasts, the INC is well known inside Iraq and has a large but unorganized following. During the 1996 Atlanta Olympics, the Iraqi Olympic flagbearer defected to the Iraqi National Congress. Before his defection he had never spoken to an INC member — yet from INC radio he was familiar enough with the INC program for a democratic Iraq that within hours he was speaking for the INC on U.S. and international network television."[8]

The CIA, Rebels, and Clandestine Radio

While the CIA built the INC, British intelligence (MI6) constructed their own opposition group in Iraq: the Iraqi National Accord. The Bush administration decided to contribute covert funding for this group as well since it aims to recruit Iraqi military officers and quietly overthrow Saddam.[9] A revolution coordinated by the INC, on the other hand, would require massive internal support, American air cover, and a long-term military campaign. Although respect for democracy and human rights would probably not be a priority for the Accord, its objectives seemed

The Rendon Group

A GLOBAL STRATEGIC COMMUNICATIONS FIRM

The Rendon Group, located in Washington, DC, was hired by the CIA to build both an Iraqi opposition group and a clandestine radio station from scratch. You can see a history of the firm's previous work, including image-repair for the Kuwaiti royal family during the Gulf War and media consulting for a CIA-backed Panamanian politician in 1989 on their homepage: http://www.rendon.com/
their lives."[13] After hundreds of propaganda campaigns the year before caused tension and lack of newness, the Accord began later that year.

The Accord brought two clandestine stations to life in 1996. On April 21, The Future (al-Mustaqbal) hit the airwaves from a MW transmitter in Jordan.[10] "This is The Future," an announcer began. "A voice for all the Iraqis confronting oppression and dictatorship, a voice that looks forward to a safe future for a new Iraq."[11] Iraqi Army Radio also began that year from the same broadcast facility. According to various news reports, these stations are recorded in London and sent by satellite to the transmitting site.[12]

The Accord was nearly demolished by an Iraqi invasion of the northern "No Fly Zone" during August and September 1996. Clinton’s lack of support for the INC-led military campaign the year before caused tension between two Kurdish groups and led to a battle. Saddam seized upon the opportunity to weaken the northern threat by pushing thousands of troops into Iraqi Kurdistan. CIA officials in territory controlled by the Accord reportedly “ran for their lives.”[13] After hundreds of Accord supporters were executed, Jordan dropped its support for the group and the clandestine stations lost a transmitter.

A year later, as Saddam argued with the United Nations over weapons inspections, The Future and Iraqi Army Radio resumed transmissions from the American broadcast facility in Kuwait — the same facility which brought the INC’s radio station to life.[14] The Command Solo aircraft that broadcast the Voice of the Gulf in 1990 was deployed to the Persian Gulf in February, just one week after American officials met with Accord representatives in London, presumably to blanket Iraq with these broadcasts as well.

Ahmad Chalabi was not pleased. During testimony in front of the U.S. Senate in March, he stated, "The INC deploys recent CIA-sponsored radio broadcasts promoting military role of Iraq. It is not up to the CIA to determine Iraq’s leadership..."[15]

Birth of an Overt Clandestine

The CIA-run stations and operations within Iraq have made little headway since 1991; therefore political analysts are now focusing on alternative contingencies. One such plan gained popularity at the beginning of 1998 for a new clandestine radio effort by Republican congressmen. The Conservative think-tank Heritage Foundation initially proposed the idea of operating a Radio Free Iraq to loosen Saddam’s grip on power.[16] By March, Clinton administration officials also supported the idea.

Radio Free Iraq will be overt, fully committing the United States to advance change in Iraq. American commitment through propaganda is cheaper than military intervention, less risky than covert operations, and more effective over the long term. "You can engage tyrants of totalitarian regimes on a day-to-day basis without firing a single shot," presidential hopeful Steve Forbes summarizes.[17] The best example of this tactic is Radio Free Europe (RFE), which played an important role in ending the Cold War by building faith among the anticommunist Eastern Europeans.

If the station becomes a reality, it will fall under the administration of the International Board for Broadcasting, as RFE is, allowing maximum flexibility in its programming and personnel management. Radio Free Iraq will also be manned by INC staff to promote democracy, freedom and human rights. $4 million has already been allocated to build a Radio Free Iran; however, it is likely that this money will be used to start a new clandestine aimed at Saddam.[18] We will probably have yet another station to chase after on SW and MW.

The National Accord is comprised of former Iraqi military officers and encourages troops loyal to Saddam to revolt. Their two clandestines operate on MW from a CIA transmitter in Kuwait and, for the time being, from an American aircraft. The schedule for al-Mustaqbal (The Future) and Iraqi Army Radio (Sawt al-quwwat al Musallah) is between 1700 and 0700 UTC on frequencies ranging from 1557 to 1584 kHz. If you hear them, you can try writing to their office in London: P.O. Box 3124, London SW19 1RL, UK. The Accord also maintains a webpage at: http://www.iraq-free.demon.co.uk/

Conclusion

Covert clandestine broadcasting clearly did not support U.S. policy efforts to overthrow Saddam. The intensity with which the CIA is employing radio propaganda, nevertheless, does reveal how vital clandestine radio remains as a tool and strategy to undermine enemies of state. Any question that these subversive radio stations would disappear after the Cold War can now be answered: Clandestines will always be somewhere on the bands ready to challenge our DXing and QSLing skills.

Nick Grace is a guest lecturer of political science at Muhammadiah University Malang, Indonesia. Those interested in monitoring the middle east crisis will appreciate the "Showdown with Iraq" website created by Cumbre DX at http://www.ralabs.com/swl/

Footnotes
1. Psywarrior
2. ibid
3. Atkinson
4. Bush speech to U.S. Congress as quoted by Jennings
7. Jennings
8. Chalabi testimony before the US Senate Foreign Relations Committee, March 2, 1998
9. Stearns
10. Issues, April 1996
15. Chalabi testimony before the US Senate Foreign Relations Committee, March 2, 1998
16. Phillips, p.23

Bibliography
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Oh, Say Can You See?
VORTAC Cuts Through the Haze and Goes the Distance

By Michael Scofield

I love mountain tops, especially when it is clear. It is both an emotional and cerebral experience. The cerebral part of me sees a mountain or valley off in the distance, and I want to know what that is. The clearer the day, the more challenging it is to identify a mountain in the distance. In other words, I want to know how far I can see.

Being a radio buff, I know one trick to discovering the distance of the horizon that doesn't depend on whether it's clear or hazy. You can use distant aeronautical navigation beacons whose VHF signals generally propagate only as far as one can see.

There are over 1,300 VOR (VHF omnidirectional range facilities) or VORTAC (VOR combined with TACAN-tactical air navigation system) transmitters scattered across the United States. Almost all of them are operated by the Federal Aviation Administration (FAA), and they generally transmit a complex radio signal on a base frequency somewhere between 108 and 118 MHz.

The signal is slightly different in each direction, thus allowing electronics in the cockpit to determine in what direction (or "radial") from that beacon the aircraft is located. Additional equipment allows the plane to interrogate the site to determine its distance from the site. With this combination of direction and distance, the pilot can know exactly where he is in three-dimensional space.

VOR stations have a distinct shape, and because they are generally away from trees or other buildings, they are easy to spot. The most obvious configuration is a small building in a clearing looking like the one above.

Most VORTAC transmitters have the distinguishing "cone" shaped structure on the top, although not all do. Inside the cone are a set of antennas which construct the distinct signal in each direction. The cone itself is about 15-20 feet tall.

This uniquely shaped building is often sighted in the middle of major airports. You can see it at Washington's National Airport, Oakland, Boston, and in the middle of Chicago's O'Hare.

Some VOR transmitters do not have the TACAN portion to them and lack the top portion of the conical structure. Good examples of this include in the one in the middle of San Francisco International Airport.

In more remote areas, you may see the cone structure mounted on the ground, on a leveled-off hilltop.

The configuration above is seen in many places in California, including Big Sur, Gaviota, San Marcus Pass, Pomona, and Julian. They generally will house the electronics in a building just off the summit, down a little so it won't obstruct the propagation of the signal in all directions. Indeed, VORTACs cannot be placed too close to buildings which may either obstruct or reflect the signal and hence give off erroneous signals.

A second antenna design for the VOR is a circle of little red domes. This is a common configuration on some gentle hilltops (such as on the dunes near Van Nuys). Usually just down the slope in some direction is a building containing the electronics. Where a TACAN antenna is also required at this site, it is usually set off a few yards to the side.

On most aeronautical charts, the VORTAC is usually designated by a symbol (right), with a compass rose around it and the letter "N" indicating magnetic north. A small box attached or nearby indicates the name of the beacon, the frequency, and the three-character symbol for it (which you can hear in Morse code).

Aeronautical flight paths often radiate off from the VORTAC, and indeed, many flight paths go from VORTAC to VORTAC.
Localizers

Sharing the 108-118 MHz band are runway localizers. These are narrow beams of a radio signal guiding aircraft down the center line of a runway. The antennae themselves are generally located at the far end of the runway they serve. Other antennae nearby provide distance-measuring signals.

Localizers are often found in pairs at each end of a major runway. On the instrument flight rule (IFR) charts, such a runway would appear as shown below. This map also shows an outer marker on the localizer at the right.

On airports where the prevailing wind is generally in one direction, there is only one localizer. Localizers generally have a Morse code identifier of four characters, the first being an "I".

Picking up the signals

Many scanners manufactured recently include the 108-118 MHz range. The signal from the VOR transmitter usually has a clicking sound, with an occasional Morse code identification.

It helps to have a larger antenna (a telescoping whip, for example) than the "rubber duck" which comes with most scanners. And I find that the VOR and localizer signals are horizontally polarized (unlike the air traffic control signals), so one must hold the radio sideways. You may look a bit silly, but no one’s likely to see you; there are few crowds on the mountain tops we’re headed for.

A modest contest

With that introduction, I can now describe a pursuit I have (a contest, of sorts, if anyone else is crazy enough to pursue it), of seeing how many VOR and localizer signals I can hear from one point on the surface of the earth. Obviously, a jet flying at 35,000 feet over West Virginia can probably pick up well over 100 VOR signals from a radius of 250 miles in any direction. But being earth-bound as I am and of limited budget, I must find a mountain top which will afford me a suitable "view."

Four points in southern California have yielded a good list of signals. But to establish an unbreakable record, it’s likely I shall have to go to Northern California, either to Mount Diablo (east of Oakland) or to Mount Hamilton (southeast of San Jose).

One problem, of course, is the intense radio signals which one often finds on the highest and best mountain sites. One may have to walk around the mountain, perhaps 100 yards away from some of the transmitters, to get the scanner to be sufficiently sensitive to the faint and distant VOR signals.

What follows are a few of the sites in southern California which I have found fruitful.

Mt. Vicente

Mt. Vicente is one of the highest points on Mulholland Drive which runs along the crest of the Santa Monica Mountains between Hollywood and Topanga Canyon. The peak—originally a radar site for Nike missiles—has now been restored into a park by a conservationist organization. (See Map 1)

The last mile is rough dirt road, but if you drive slow, you can make it. This was one of the first sites I used, and it proved fruitful with nine VORs audible.

I could not pick up the Ventura VOR; too many high mountains (such as Castro Peak) were between us. I did, however, pick up localizers at Van Nuys and Burbank.

Onyx Peak

This 9,114 ft. mountain dominates the eastern end of the San Bernardino range. To the east or northeast nothing comes close to its height. It has a clear view over much of the Mojave Desert. But using the VOR signals, I discovered it has a "view" far down the Coachella and Imperial Valleys, all the way to Mexicali. (See Map 2).

Onyx Peak doesn’t have easy access. The road to the summit is blocked by a gate, but a 2-mile hike will get you there. The mountain has quite a few electronic sites on it, so one has to move away from them for the scanner.

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receiver to be sufficiently sensitive.

What surprised me about this peak was being able to pick up the signals of the Daggett (DAG) and Hector (HEC) VORTACs far to the north. I question whether this is true line of sight!

---

**Glendora Mountain Road**

This is not a particularly high point and wasn’t one of my first choices, but it proved to be very fruitful, yielding 10 VOR signals and six localizer signals. (See Map 3).

There was no single point along the 3-mile stretch of road where I could hear all the signals at the same time. Indeed, the higher up you got, especially when you got in sight of Sunset Peak to the east and Mount Wilson to the west, the scanner tended to pick up harmonics from the powerful TV broadcast transmitters.

In addition to the VOR signals, I could hear a number of localizers. There were two at LAX, one from the Pomona airport (Brackett Field), one from the Riverside Airport (which points westward), and two from Orange County John Wayne airport.

The plum at this site turned out to be the Julian VORTAC. I could see the observatory dome on Mt. Palomar, but I was surprised that the Julian VORTAC put a signal all the way up here.

---

**Blue Ridge Summit**

This high point is one of my favorites. On a single ridge, you can see the high desert to the north and some of the LA basin to the south. On the day I took these readings, I could see San Clemente Island about 105 miles to the south and the Telescope range above Death Valley about 120 miles to the north. Higher up on the ridge, I did successfully pick up the Gorman VORTAC which is a hefty distance up the ridge line. (See Map 4).

I picked up two localizers at the Orange County airport. I expected one (I-SNA, 111.75 MHz.), but was surprised to discover a new signal (I-OJW, 108.3 MHz) which I later learned was another beacon at John Wayne airport.

I was rather surprised that I could not pick up any beacon on San Clemente Island. I once read that there was a VORTAC there near the runway, but nothing on the internet confirmed this.

---

**Cerro Noroeste (Mt. Abel)**

This 8,000+ ft. peak affords a spectacular view to the north, west, and south. Its twin peak to the east, Mt. Pinos, is slightly higher, and will afford a view in that direction. Perhaps next trip. On this trip, I took what I could drive to quickly.

From the road ascending the northwest slope of Mt. Abel, I could clearly hear a number of VOR signals around central California. The most surprising, to the north, was the Friant VORTAC north of Fresno, which is up on a hill with a low valley between. I could clearly hear the FRA VORTAC signal which measures 160 miles from Mt. Abel. (See Map 5).

I could also hear a HIWAS (Hazardous Inflight Weather Advisory Service) transmission on 114.0, but I could not hear an ID, so I probably was hearing Julian; I can’t really be sure. That would be quite a bounce!

I was most surprised to be able to hear the LAX beacon far to the south, with so many high mountains between us. However, if I could hear the LAX and Filmore beacons in spite of the terrain, why couldn’t I hear the Ventura and Catalina beacons also?

---

**Mt. Diablo**

Mt. Diablo is a conspicuous landmark in northern California, partly because it stands alone. There are no other hills near it of its height, and the land around it is relatively low.

It can be seen from so many places in the Bay area and the Sacramento valley.

Early on a Friday morning, I drove the narrow, winding (but paved) road to the top of this mountain east of Walnut Creek. It was clear and windy, and the view was spectacular.

To the east, above a layer of haze covering the San Joaquin Valley, I could see peaks of the high Sierra mountains around Yosemite National Park. I could see about half way up the Sacramento River to the city of Sacramento, lost in that haze.

To the north, south, and west, it was sparkingly clear. I could see Mt. St. Helena to the north. To the west, the Golden Gate Bridge
and every house in Marin County. To the
southwest, the giant blimp hangar at Moffett
Field, and the peak of Loma Prieta south of
San Jose. To the due south, I could see the
domes on Mt. Hamilton. (See Map 6).
I heard a number of VOR’s from the top, but
was surprised not to hear some from the
northern Sacramento valley. I couldn’t get
Williams, Maxwell, or Marysville. This may
be partly because there is so much RF inter-
fERENCE FROM THE FM broadcast stations on the
peak.
But I was pleased to pick up the Pt. Reyes
VOR which is on the top of a ridge. I could
not, however, hear El Nido, or Panoche (which
had a ridge between us).
All in all, even with fourteen logs, the
radio reception at Mt. Diablo was a bit of a
disappointment, primarily because of the ra-
dio interference. Visually, it was spectacular!

Mt. Hamilton is a Winner

I suspected this mountain peak would give
me the most VOR signals. This 4,209 ft. peak
is about 15 miles east of San Jose, and the
white dome of the famous Lick Observatory
is clearly visible from much of the west San
Francisco bay area.
The road to the top is not for the faint-
hearted. It is narrow and winding, in places
reduced to a 30-ft. turning radius. It is paved
all the way, but must be driven quite slowly in
places because of the tightness of the turns.
(See Map 6).
At the top of Mt. Hamilton are a number of
telescope facilities. The original observatory
building is open to the public from 1:00 to
5:00 most afternoons, and contains the origi-
nal 24-inch refractor telescope built in 1888.
From the top of the peak, I got some
interference from FM broadcast sta-
tions, although not as severe as that en-
countered on Mt. Diablo to the north.
There appear to be no such FM or TV
broadcast transmitters on this peak, al-
though there are a few utility stations at the
east end of the ridge.
I was very pleased with the total
of 16 VOR signals, and an addi-
tional six runway loca-
tizer signals. Air-
ports with localizers included San Francisco
International (both runways 28-left and
28-right), the San Jose runways, Hayward, and
Oakland.
As expected, I successfully heard a num-
ber of VOR signals in the Bay area. Similarly,
some VOR’s in the central valley were to be
expected. Hangtown (the VOR at the
Placerville airport) was a pleasant surprise.
And Salinas was to be expected.

To the south, I had hoped to hear the Big
Sur VORTAC which is a good distance down
the coast, but atop a ridge overlooking the
Pacific. It came through quite clearly, as did
the Panoche VOR down the Diablo range to
the southeast. I was surprised and quite
pleased to hear the Friant VORTAC located
on a ridge north of Fresno. I had heard this one
from Mt. Abell to the south.
I was, however, totally surprised to hear a
weak but discernable signal from the Squaw
Valley VORTAC up in the high Sierras near
Lake Tahoe. Indeed, not thinking I could hear
that far, when I noted the frequency (113.2
MHz.) and the last two characters of the
Morse Code identifier (somewhat obscured by
the voice HIWAS broadcast riding on the
same carrier), I initially didn’t look that far
east on my aeronautical chart to find it.

I expected to pick up Pt. Reyes, because
two years ago, I could clearly see Mt. Hamilton
from the Pt. Reyes lighthouse on an unusually
clear day. But while the Pt. Reyes VOR is up
on a ridge, it may be shielded by Mt. Tamalpais.
Similarly, I didn’t hear the Scaggs Island
VORTAC as I expected to. Again, it may have
been shielded by the Oakland hills. But then,
I could hear the Concord VOR, which was a
total surprise given the terrain between.
I tried for several VORs which I had hoped
to hear (Mendocino, Pt. Reyes, Scaggs Island,
Sacramento, Clovis, and Marysville) but could
verify nothing above the noise. So they don’t
Eff even
so, 16 VOR’s and 6 localizers is
rather phenomenal, and I doubt if any other
point on the surface of the earth (in the United
States, at least) will yield that many signals.
I think I have a record. Should I contact
Guinness?
As we all know, the federal government has directed the FCC to auction off portions of the spectrum to help balance the budget and provide additional monies to fund Social Security and other programs. The fact that many high-bidders for spectrum have recently defaulted on their obligations to Washington has, apparently, dissuaded legislators from taking the position that the sale of the ether can be their manna from heaven.

During the New York City World Trade Center tragedy, in which a terrorist group bombed the garage of the building in an attempt to topple one of the towers, police, fire, and EMS units found that they could not communicate with officials from other agencies such as the Port Authority as well as the state and federal authorities that responded. Representatives from the various groups argued to Congress and the Commission that there was not enough spectrum available to allow for seamless public safety communications with easy interoperability.

INTRODUCTION. By this action, we (the FCC) are reallocating the 746-806 MHz band, currently comprising television (TV) channels 60-69. As mandated by the Balanced Budget Act of 1997, we are allocating 24 MHz, at 764-776 MHz and 794-806 MHz, on a primary basis to the fixed and mobile services, and designating this spectrum for public safety use. This allocation will help meet the need of public safety to ensure interoperable communications among various public safety organizations, provide for growth of existing systems, and accommodate new types of services that will strengthen and enhance public safety.

As further mandated by the Budget Act, we are allocating the remaining 36 MHz at 746-764 MHz and 776-794 MHz on a primary basis to the fixed, mobile, and new broadcasting services for commercial use. Licenses in this 36 MHz of spectrum will be assigned through competitive bidding in accordance with procedures that will be determined in a later proceeding. This 36 MHz of spectrum can be used to make new technologies and services available to the American public. These proposals are an outgrowth of our digital television (DTV) transition plan.

DISCUSSION. In the Notice, we observed that increased dependence upon radio communications by public safety agencies has led to a shortage of spectrum available for public safety communications. Because the 794-806 MHz band is subjacent to existing public safety operations in the 806-824 MHz band, it holds the best potential for expansion of and interoperability with existing systems. The close proximity to existing spectrum used for public safety could also reduce the difficulty and cost of designing equipment. Further, most public safety communications systems require some minimum separation between the receive and transmit frequencies, for technical reasons. We tentatively found that a separation of 30 MHz is adequate for public safety systems.

The New Band in Town

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COMMENTS. Commenters representing public safety agencies, radio equipment manufacturers, and many states, counties, and municipalities strongly supported reallocating 24 MHz of channels 60-69 for public safety use. For example, the Association of Public-Safety Communications Officials-International (APCO) states that Congress, the Administration, and the Commission itself have recognized the substantial need to reallocate additional spectrum to public safety. APCO stresses that the reallocation of 24 MHz from the 746-806 MHz band will address a significant portion of public safety spectrum needs.

The State of California applauds the speed with which we have moved to satisfy public safety spectrum needs, citing its own report which identifies several spectrum related deficiencies in its ability to meet the needs of state agencies.

The Land Mobile Communications Council (LMCC) concurs with our proposal to allocate spectrum for public safety services, stating that additional public safety spectrum would help mitigate current spectrum overcrowding, enhance interoperability among public safety agencies, and allow the development of cost effective advanced communications systems.

What does this all mean for scanner manufacturers? It’s very simple: Customers who had purchased very wide-band high-end scanners, such as the ICOM series, with full spectrum coverage from 25-1300 MHz (less cellular, of course), should be okay. All other hobbyists will be out of luck if a nearby agency happens to license this band.

Unclear at the moment is what transmission scheme will be used by public safety agencies in their new slice of spectrum. Presumably the band will be used by trunking systems, and, increasingly, by digital trunked systems, probably with 12.5 kHz spacing (and eventually 6.25 kHz spacing), as opposed to the standard 25 kHz. How this is addressed by the manufacturers and software developers is a topic for another article. (We’re also not 100 percent sure which side will be the input and which the output.)

In practice, the scanner manufacturers may find the opening of 700 MHz to be an opportunity similar to the addition of 800 MHz some 15 or 20 years ago. Ever since the Bristol, Connecticut, police (which we believe was the very first 800 MHz public safety agency) switched bands, Uniden and Radio Shack have charged a premium for a scanner incorporating these high frequencies (just as they did, for a short while, when the UHF “T-Band” was first introduced). The two titans of scanning, hopefully, will eventually offer scanners with 700 MHz. If customers are asked to once again cough-up a small premium for it, then so be it.

The Bill Goes On

H.R. 2369, The Wireless Privacy Enhancement Act of 1998, may soon become law. In February, the bill quickly moved through the House Commerce Committee on a voice vote and, as expected, was sent to the House floor with no further amendments. On Thursday, March 5th, the bill was placed before the House of Representatives for consideration. We understand that there was a short “debate” between Billy Tauzin (R, LA) who introduced the bill, discussing it for the...
record with Rep. Markley (D, MA) who co-sponsored it.

If there was a “debate,” it was likely more of a pat-on-the-back session between the two, as well as a “colloquy” in which statements are read into the record concerning the purported goals and consequences of the Act. We understand this language can be used in court cases to demonstrate, for one side or the other, the actual desired effects of the bill the legislators had in mind it was penned. (This editor has ordered a copy of the tape of the House debate and of Billy Tauzin’s C-SPAN roundtable discussion the morning of the vote. If there is anything interesting to report, you’ll read about it later this year.)

As we’ve discussed many times in these pages, H.R. 2369 is not a bill we wanted. There are still deplorable issues that the legislation raises, most particularly the matter of decoding public safety digital transmissions. Many also continue to argue that there should be no monitoring restrictions whatsoever. They believe that, if Congress wishes to write a law, it should be one that requires cellular and PCS providers to encrypt, and guarantee the security of, their customers’ transmissions. This editor won’t bore you with the counter-arguments again other than to say it’s not political reality.

H.R. 2369 passed the House 414 to 1. (The one dissenting voice came from Ron Paul, a Texas Republican representative from Texas, perhaps the Ft. Worth area... You can figure that one out.)

Those who voiced the opinion that the airwaves should remain completely free were dismissed as laughingstocks or who had no understanding of how Washington works. H.R. 2369 requires scanner manufacturers to remove cellular and PCS frequencies from their scanners. This may mean that we’ll lose narrowband PCS frequencies from 901-902 MHz, from 930-931 or 932 MHz, and from 940-941 MHz, as well as wide-band PCS from 1850-1990 MHz. All in all, this is not much of a loss, especially considering the original language of the bill which would have meant the end of our hobby, many jobs, and a terrible loss of freedom.

A “Section-by-Section Analysis of the Legislation,” provided to me by attorneys working for the House Commerce Staff, sheds light increased on the intentions of H.R. 2369. Here are some of the more critical passages of this Report, which may not have represented the final version to be read into the record:

“Section 2(a) extends the prohibition in section 302(b) of the Communications Act of 1934 on manufacturing, selling, etc., scanning devices to modifying as well. While the Committee believes that this is already covered by existing law, it has decided to make the prohibition explicit to prevent any misreading of the statute.” (No comment necessary.)

This section is perhaps the most interesting and controversial: “Section 2(b) makes amendment to section 302(d) of the Communications Act of 1934. Section 2(b) amends section 302(d)(1) to expand the scope to new communications technologies such as personal communications services (PCS), and protected specialized mobile radio and paging services. It also requires the Commission to deny equipment authorization to scanners that are capable of being equipped with certain decoders.

“By this language, the Committee does not intend to hamper the inclusion of consumer-friendly features on radio scanners such as earplug jacks or other ports. But the Committee intends manufacturers now to design scanners with ports that cannot be used to equip the scanner with a decoder that can convert digital cellular, personal communications services, protected specialized mobile radio services to analog voice audio; or convert protected paging services to alphanumeric text; or otherwise decrypt radio transmissions for the purposes of unauthorized transmissions. (Editor: Reception must be the intended last word instead of ‘transmission.’) Thus, manufacturers, after the enactment of the Wireless Privacy Enhancement Act, will be under an obligation to ensure that consumer-friendly features cannot be used to equip scanners with such prohibited decoders.”

The document then goes on to discuss how the FCC, with the passage of this Act, now has the authority to prescribe rules to enhance the privacy of “users of frequencies shared by commercial services and the public safety community.”

The FCC will also consider rules and regulations requiring “that scanning receivers be manufactured in a manner that prevents any tampering or alteration by the user that would permit the device to be used unlawfully for interception or divulgence of radio communications.” We may actually see warning labels on scanners in the future. The manufacturers are provided sufficient time to sell off their current inventory.

While the entire Report is of great interest, the last bit of language which directly affects our ability to scan legally is found in section three: “Section 3(a)(4) preserves the authorization of certain interceptions or disclosures provided in Chapter 119 of Title 18. That chapter governs wire and electronic communications interception and interception of oral communications. Section 2511(g) provides a number of exceptions for the interception to the chapter’s prohibitions on interception. The majority of these exceptions relate to government interceptions. However, Section 2511(g) provides a number of broad exceptions for the interception by private parties of radio communications, including those that are transmitted over a) a system that is configured for ready access by the general public; b) by any station for the use of the general public, or that relates to ships, aircraft, vehicles or persons in distress; c) any governmental, law enforcement, civil defense, private land mobile, or public safety communications system that is readily accessible to the general public; d) by a station operating in the amateur, citizen’s band (CB); and e) by any marine or aeronautical communications system.

“Because the Committee preserved the Chapter 119 exceptions in its amendment of Section 705(a) of the Communications Act, the Committee does not intend for the Commission or any other enforcement agency to investigate or fine parties for the interceptions authorized by Chapter 119. Therefore, the Committee does not intend for uses of scanning receivers and receiving radios such as shortwave radios, that are consistent with the Section 2511(g) exceptions to be investigated or fined under Section 705(a).”

We shouldn’t need to spend too much more time discussing H.R. 2369. Although the Senate has yet to act upon the Bill, it is generally considered noncontroversial and is likely to be voted on without discussion. The next time you’ll probably read about it on these pages is when President Clinton signs it into law. I’ll leave you with this: It all could have been a helluva lot worse.

Final Notes

Trunkcom, the list server dedicated to the exchange of trunking-related information, is moving (or perhaps already has moved) to another home. We gratefully thank Grove Enterprises for freely hosting Trunkcom since its inception. You will be able to find details on our move at the www.grove.net web site. As always, a special note of thanks goes out to list administrator John McColman, without whom the list would be in chaos.
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10,500 entries with latest schedules of all clandestine, domestic and international broadcast stations worldwide, compiled by top experts in the Netherlands. 12,000 speeds frequencies from our international bestseller 1998 Radio Guide (see below). 15,000 formerly active frequencies. All on one disk for Windows or Windows95. You can search for specific frequencies, countries, stations, language, calls signs, and areas and browse through all that data within minutes! Can't get faster and easier than that.

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- 300 lockouts per system.
- Temporary lockout for Scan list entries.
- Scan, Track. Search modes w/individual user selected delay values.
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- System finder mode helps you find new systems.
- Personality files for named scan list and lockout files you can recall between sessions.
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- Real time repeater activity and frequency display.
- Easy, intuitive, menu driven operation with mouse support.

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PO Box 610482
Newton Highlands, MA 02161

Order line: 1-800-772-6701

More info: www.scanmaster.com
Recent tensions in Iraq have apparently caused an increase in HF "numbers" broadcasts. Nowhere is this more dramatic than on those three-letter-ID stations supposedly operated by Israel's controversial spy agency, the Mossad.

This formidable organization, whose name translates as "Institute," is a combined secret police and intelligence group. It's been given a sweeping mandate to counter military and terrorist threats, both foreign and domestic. Operations are covert, often bold, and sometimes bloody.

Mossad was established in 1951 by then-Prime Minister David Ben Gurion. Its Director General, sometimes known as "S," still reports only to the PM and defense secretary. They've been in the news of late following a botched assassination plot, and an uproar which nearly brought down Israel's government.

For some years, Mossad has been linked to an especially loud and bizarre set of HF "numbers" transmissions. "Numbers," in radiospeak, are stations that broadcast long strings of digits and letters in groups, perhaps as coded messages. At any time of day, there's probably a numbers transmission going somewhere.

Modern numbers, as we know them, started during the Cold War. Many assumed that they'd end with it. They didn't. In their utter strangeness, they remain as compelling as ever.

For a generation, these signals have been tracked, located, and analyzed for any technical clues at all. Traffic has been crunched, correlated, and attacked with every statistical tool known. Authors, often with entertaining pseudonyms such as "Havana Moon," have come and gone.

What is the result of all this work? Absolutely nothing. We have suspicions, some evidence, some spy stories, but no hard facts. The people who know are still not telling.

It's especially interesting that numbers stations go out of their way to get noticed. No spy-movie stealth for these guys. They're running serious power, hammer-down power, grab-the-channel power, wattage to your cottage. Some, in addition, send hours of carriers, or play music, or count to ten. Are they merely a colossal diversion, an expensive disinformation, or a guaranteed minimum noise to foil traffic analysis? Or are they control messages for grunt-level informers, ordinary folks recruited or blackmail-er the real spies, who listen on inconspicuous consumer radios and use easily concealed one-time code pads?

We don't know. Nor are we about to know.

Getting back to Mossad, one especially striking logsheet came from Takashi Yamaguchi, of Nagasaki, Japan. He heard a lot of numbers stations, representative of the type we're talking about here. This month's column contains a list of his and other loggings.

Mossad's five-number, phonetic, English language format is distinctive. It's also rather captivating in its sheer weirdness, making no attempt whatsoever to explain itself to anyone.

Broadcasts are in a female voice, using standard phonetics, always in AM or USB. There's a mechanical sound, as with most of these stations. They're probably using digitized words, phone company style. For some reason, there's often a French accent. If "she" says the phonetic "N" as "November," you have a dead giveaway.

They begin on the hour or quarter-hour, with lengthy repetition of what is probably a callsign or identifier. These are always three letters, usually postended by the number two. Most of the time, it's followed by a string of phonetic, five-letter groups.

Parallel transmissions on two or more frequencies are common. It's very productive to keep a log of Mossad stations, as times and frequencies don't change much.

I have always hoped that the radio engineers for these various intelligence groups get a chuckle reading all our theories in the shorthand press. I certainly enjoy writing about them.

**Quick corrections**

In the March Utility World, the frequency for marine bulletins from Coast Guard groups was given as 2760 kHz. Well, I transposed digits. The real frequency, of course, is 2670, and it's as active as ever.

Some people may not be hearing the double ticks mentioned in the April WWV column. This is because, for the first time in a while, there aren't any! I suspect that UTC has drifted into close sync with UT1, but this never lasts.

**Recent Mossad Numbers Loggings**

<table>
<thead>
<tr>
<th>kHz</th>
<th>ID</th>
<th>Time</th>
<th>By Simulcasts or Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>2270</td>
<td>SYN 2</td>
<td>2200</td>
<td>YJS usually heard here</td>
</tr>
<tr>
<td>2626</td>
<td>MW 2</td>
<td>2215</td>
<td>R</td>
</tr>
<tr>
<td>2743</td>
<td>UX 2</td>
<td>2300</td>
<td>B</td>
</tr>
<tr>
<td>2953</td>
<td>KPA 2</td>
<td>1815</td>
<td>Y</td>
</tr>
<tr>
<td>3150</td>
<td>PDC</td>
<td>1800</td>
<td>B</td>
</tr>
<tr>
<td>3152</td>
<td>PCD</td>
<td>1800</td>
<td>B</td>
</tr>
<tr>
<td>3370</td>
<td>MW 2</td>
<td>1415</td>
<td>Y</td>
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<td>SYN 2</td>
<td>1745</td>
<td>Y</td>
</tr>
<tr>
<td>3470</td>
<td>ART</td>
<td>1950</td>
<td>Y</td>
</tr>
<tr>
<td>3480</td>
<td>MW 2</td>
<td>0119</td>
<td>R</td>
</tr>
<tr>
<td>3480</td>
<td>ART</td>
<td>2245</td>
<td>B</td>
</tr>
<tr>
<td>3480</td>
<td>YHF</td>
<td>1730</td>
<td>Y</td>
</tr>
<tr>
<td>3480</td>
<td>PDC</td>
<td>1800</td>
<td>Y</td>
</tr>
<tr>
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<td>SYN 2</td>
<td>1945</td>
<td>Y</td>
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<tr>
<td>3480</td>
<td>SYN 2</td>
<td>2145</td>
<td>Y</td>
</tr>
<tr>
<td>4560</td>
<td>FTJ</td>
<td>1730</td>
<td>B</td>
</tr>
<tr>
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<td>FTJ</td>
<td>2158</td>
<td>B</td>
</tr>
<tr>
<td>4580</td>
<td>VLB 2</td>
<td>1545</td>
<td>Y</td>
</tr>
<tr>
<td>4890</td>
<td>ULX</td>
<td>2200</td>
<td>B</td>
</tr>
<tr>
<td>5091</td>
<td>JSR</td>
<td>1831</td>
<td>R</td>
</tr>
<tr>
<td>5230</td>
<td>CIO 2</td>
<td>1848</td>
<td>R</td>
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<td>1400</td>
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<tr>
<td>6270</td>
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<td>Y</td>
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<tr>
<td>6370</td>
<td>KPA 2</td>
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<td>Y</td>
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<td>MW 2</td>
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<tr>
<td>6498</td>
<td>PCD</td>
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<td>PCD</td>
<td>1500</td>
<td>Y</td>
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<tr>
<td>6588</td>
<td>MW 2</td>
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<td>Y</td>
</tr>
<tr>
<td>6688</td>
<td>VLB 2</td>
<td>1245</td>
<td>Y</td>
</tr>
<tr>
<td>6745</td>
<td>VLB 2</td>
<td>1245</td>
<td>Y</td>
</tr>
<tr>
<td>6840</td>
<td>EIZ</td>
<td>1800</td>
<td>B</td>
</tr>
<tr>
<td>6840</td>
<td>EIZ</td>
<td>1600</td>
<td>B</td>
</tr>
<tr>
<td>7445</td>
<td>SYN 2</td>
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<td>Y</td>
</tr>
<tr>
<td>7918</td>
<td>YHF</td>
<td>1400</td>
<td>Y</td>
</tr>
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<td>9130</td>
<td>EIZ</td>
<td>1600</td>
<td>B</td>
</tr>
<tr>
<td>10352</td>
<td>CIO 2</td>
<td>1445</td>
<td>B</td>
</tr>
<tr>
<td>11565</td>
<td>EIZ</td>
<td>1430</td>
<td>Y</td>
</tr>
<tr>
<td>13533</td>
<td>EIZ</td>
<td>1430</td>
<td>Y</td>
</tr>
</tbody>
</table>

A | Any Boender, Holland |
R | Alf Rosenstock, WUN News |
Y | Takashi Yamaguchi, Japan |
## Utility Loggings

**Hugh Stegman**

### Abbreviations used in this column

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>RTTY speed/shift (varies)</td>
<td><strong>MFA</strong> Ministry of Foreign Affairs</td>
</tr>
<tr>
<td>AB</td>
<td>Air Base</td>
</tr>
<tr>
<td>AF</td>
<td>Air Force</td>
</tr>
<tr>
<td>AFB</td>
<td>Air Force Base</td>
</tr>
<tr>
<td>AM</td>
<td>Amplitude modulation</td>
</tr>
<tr>
<td>ANDVT</td>
<td>Advanced Narrowband Digital Voice Terminal</td>
</tr>
<tr>
<td>ARQ</td>
<td>Automatic Repeat Request (an RTTY mode)</td>
</tr>
<tr>
<td>ARRS</td>
<td>Aerospace Rescue and Recovery Service</td>
</tr>
<tr>
<td>CG</td>
<td>Coast Guard</td>
</tr>
<tr>
<td>CP</td>
<td>Command Post</td>
</tr>
<tr>
<td>CQ</td>
<td>General call: Hello all stations</td>
</tr>
<tr>
<td>CW</td>
<td>Continuous Wave (Morse code)</td>
</tr>
<tr>
<td>DoD</td>
<td>Department of Defense</td>
</tr>
<tr>
<td>DSM</td>
<td>Defense Switched Network (formerly AUTODOM)</td>
</tr>
<tr>
<td>EAM</td>
<td>Emergency Action Message</td>
</tr>
<tr>
<td>FEC</td>
<td>Forward Error Correction (an RTTY mode)</td>
</tr>
<tr>
<td>SMFS</td>
<td>Global High Frequency System</td>
</tr>
<tr>
<td>VOLMET</td>
<td>Flying Weather (from French)</td>
</tr>
</tbody>
</table>

All transmissions are USB (upper sideband) unless otherwise indicated. All frequencies are in kHz (kilohertz) and all times are UTC (Coordinated Universal Time).

60.0 MSF-Teddington time signals, from UK in CW, at 1245. (Ary Boender, Gothenburg)

75.0 HBG-Swiss Observatoire Neuchatel time signals, in CW at 1246. (Boender, Gothenburg)

77.5 DCF 77, German PTB time signals in CW at 1232. (Boender, Gothenburg)

2840.7 DLVK-ZB Hiddensee, German customs launch with position report for Coast Guard Neustad, SITOR-A (100 baud), at 1639. (Boender, Gothenburg)

2941.0 Moscow Volmet, flying weather at 2244. (Boender, Gothenburg)

3084.0 Unid-Female 5-figure numbers in Chinese, LSB at 1435. (Takashi Yamaguchi-Japan)

3196.9 Orange 400 and 400-300 US Navy, working something sounding like, "Superior Valley Tower," mentioned "Alameda" and "taxi runway 090," at 0145. (Paul Bunyan-MO)

3756.0 Unid-"The Pip," station that makes CW pipes in 80 meter amateur band, around years, at 0048. (Boender, Gothenburg)

4077.0 RMP-Russian Navy, Kamalgrad, CW weather at 1719. (Boender, Gothenburg)

4398.0 YOH-Constantia Radio, Romania, working und vessel at 1728. (Boender, Gothenburg)

4482.0 Unid-Russian "man" numbers in AM at 2210. (Boender, Gothenburg)

4485.0 Unid-Czech "man," also 5027, several days at 1355. (Boender, Gothenburg)

4507.0 Unid-Spanish 5-figure "numbers" in AM, at 1102. (Boender, Gothenburg)

4584.0 Goll Knlo-German language, 5-figure "numbers" broadcast at 2230. (Boender, Gothenburg)

4601.5 OA-Dublin, Navy station with routine messages in SITOR-A at 1732. (Boender, Gothenburg)

4745.0 Teardrop-USAF, calling Nightwatch 01 at 1625. Also 5026. (Jeff Haverlah-Texas)

5190.0 **NORAD** Northern Air Defense Command, 5-figure "numbers" in AM at 1625. (Boender, Gothenburg)

5266.0 HEP-5-Kontonspolizei Zuerich, with CW VVV marker, at 1144. (Boender, Gothenburg)

5391.0 BBO-Royal Navy, UK, in exercise with C-0-P, at 1424. (Boender, Gothenburg)

5403.0 Unid-RAF, Buchan, radio check with E-9-1, at 1407. (Boender, Gothenburg)

5422.0 Unid-Lincolnshire Poacher, numbers, at 1700. Also 1096 and 8464. (Yamaguchi-Japan)

5429.5 Air Force Two, working Andrews AFB at 0727. (Bunyan-MO)

5596.0 Air Force One-SAM 28000, position report for unknown station at 0841. (Boender-Netherlands)

5687.0 DMM-91 German AF, Muenter, working und Aircraft at 1422. (Boender, Gothenburg)

5714.7 Architect-RF, Upavon, UK, with "celebrity" broadcast at 2137. (Boender, Gothenburg)

5914.7 KAWN-USG, Saddlesbunch Key, with coded weather, in RTTY (75/60), at 0604. (Bob Hall-RSA)

6255.0 Unid-Spanish female 5-figure numbers, at 0410. (Boender-MO)

6485.0 Unid-Lincolnshire Poacher numbers at 1600. Also 6655, 10426. (Yamaguchi-Japan)

6485.0 Unid-Lincolnshire Poacher numbers at 1600. Also 6655, 10426. (Yamaguchi-Japan)

6493.5 LYL-Klaipedra Radio, Lithuania, with CW navigation warnings at 2206. (Boender, Gothenburg)

6502.0 TBB-6-Mexican Navy, Ankara, calling TBDJ in CW at 2202. (Boender, Gothenburg)

6712.0 Offutt-USAF-GHKS, Nebraska, EAM at 0656. (Haverlah-Texas)

6739.0 Offutt-USAF-GHKS, Nebraska, EAM at 1504. (Haverlah-Texas)

6751.0 Unid-USAF with relay of Nebraska football game from a local FM station, 2015 through 2255. (Boender-MO)

6779.0 DHJ-59 German Navy, Wilhelmshaven, working unknown vessel in band RTTY and USB, at 2153. (Boender-MO)

6802.0 Unid-Spanish 3/2-figure "numbers" in full-carrier USB, at 0304. (Boender-MO) Usually made RFE-Hugh

6817.0 SAM-60201 and 60202-USAF VIP aircraft, radio checks with Andy on F-709, at 1512. (Boender-MO)

6826.0 Unid-Spanish 5-digit numbers in AAM at 0334. (Dean Burgess-MA)

6871.0 HEP-7-Kontonspolizei Zuerich, Switzerland, with VV marker in CW at 1505. (Boender, Gothenburg)

6945.0 Unid-5-figure CW "numbers" at 1500. (Boender, Gothenburg)

6959.0 Unid-Lincolnshire Poacher with 5-figure "numbers," simulating 11549, at 2000. (Boender, Gothenburg) Long 5-figure broadcast, at 2040. (Burgess-MA) Und, might be the Poacher, 5-figure, at 2217. (Boender-MO)

6984.0 SMN-299-MFA, Warsaw, with messages in RTTY (Pol-ARQ, 100), at 1440. (Boender, Gothenburg)

6993.0 Air Force two, patch to Crown via Andy, at 0151. (Boender-MO) Crown is the White House Communication Office. Hugh

7325.0 SAM-60201 and 27000-USAF VIP aircraft, working Andy on F-268. (Boender-MO)

7337.0 Unid-Lincolnshire Poacher numbers, late tune in at 2245. (Boender, Gothenburg)

7600.0 Unid-"Counter" type 5-figure numbers, also 10597, at 1500. (Boender, Gothenburg)

7831.0 Alligator-USAF working Nightwatch 01 (Airborne CP) in net with New Guard, Yelem, Rebellion, Genetic, Textbook, and Ski Boot. Clear and ANDVT were used, beginning at 2010. (Haverlah, Texas)

8032.0 SAM-60206-USAF VIP, patching Robert Gray Base Ops, via Andrews AFB on F-498, at 0137. (Boender-MO)

8375.0 New Star Broadcasting, Taiwan, with Chinese female 4-figure numbers in AM at 1300. Similar transmissions heard on 8300, 9725, 11430, 11350 and 15338. (Yamaguchi-Japan)

8496.0 CLA-Havana, Cuba, with CW traffic list at 0628. (Dick Dillman-CA)

8636.0 HLW-Seoul, Korea, working CW ship traffic at 0612. (Dillman-CA)

8688.5 ZSC-Cape Town, RSA, with CW traffic list at 0635. (Dillman-CA)

9016.0 Chalice Alpha-signal check with Nightwatch at 1544. WAR 46, working Nightwatch, went to 2190 at 0123. Nightwatch with 26 character EAM, masked by own 500-Hz tone at 1517 and 1523. Magnavox-USAF, repeating 26 character EAM from Offutt, then working Projector,
11448.7. Unid-Lincolnshire Poacher, jammed and unreadable, at 1100, 1200, and 1300. Again, clear, simulcasting 10426, at 1400. (Boender-Netherlands) Unid-Poacher at 1200, also 15682 and 16804. (Yamaguchi-Japan) 14890.0. Unid-Russian man AM numbers, two days at 0800. (Boender-Netherlands) 14996.0. RWM-Russian CW time signals at 1710. (Boender-Netherlands) 15016.0. Offset-USAF GHFS, with 6 character EAM "for Postulate" at 1938, "for Curley Top," at 1939. (Haverlah-Texas) 15821.7. SAM-MFA, Stockholm, with embassy traffic for Tel Aviv, in RTTY (Swed-ARQ, 100/400) at 1729. (Bob Hall-RSA) 16335.0. FZS 63-St. Denis Meteorological, with tropical cyclone warning from Reunion Island, in RTTY (75/400), at 0940. (Hall-RSA) 16357.0. OZL-MFA, Prague, with news in Czech, RTTY (100/400), at 0859. (Hall-RSA) 16661.7. EGY-possibly London embassy, with 5-letter code groups in Sitor-B at 1150. (Hall-RSA) 16680.0. SAM-MFA, Stockholm, with news in RTTY (Swed-ARQ, 100/400), at 0945. (Hall-RSA) 17050.0. 4XZ-Israel Navy, Tel Aviv, with VUV marker in CW, at 1415. (Boender-Netherlands) 17105.0. IRM-Rome, Italy, with CW traffic list at 1704. (Dillman-CA) 17113.0. GKB-Portsmouth head, England, CW traffic list at 1700. (Dillman-CA) 17416.8. SAM-MFA, Stockholm, with 5-letter code groups to Lagos embassy, in RTTY (Swed-ARQ, 100/400), at 0915. (Hall-RSA) 17417.3. SAM-MFA, Stockholm, with 5-letter code groups to Nairobi embassy, in RTTY (Swed-ARQ, 100/400), at 1537. Changed frequency from 17417.1. (Hall-RSA) 17432.0. DFZG, MFA Beiragide, with encrypted messages to many embassies, in RTTY (Boaud, 75), at 1437. (Boender-Netherlands) 17441.5. SYE-Nairobi Meteorological, with coded weather in RTTY (100/825), at 1555. (Hall-RSA) 17521.0. HSW61-Bangkok Meteorological, with coded weather in RTTY (50/209), at 1534. (Hall-RSA) 18064.0. SNN299-MFA, Warsaw, with administrative details, then long message about Luanda, in RTTY (Pol-ARQ, 100/240) at 0801. (Hall-RSA) 18183.5. Algiers MFA (tentative ID), with news in French, at 0943. (Hall-RSA) 18183.5. MFA, Algiers, with French to "AMBALG Lagos," then Conakry, Kampa, and Dakar, at 0943. (Hall-RSA) 18258.5. HBD 32-Swiss embassy, Brasilia, with 5-letter code groups signed BRAZILMA, in RTTY (ARQ) at 1240, again at 1527. (Hall-RSA) 18276.7. HB031-Swiss embassy, Buenos Aires, with 5-letter code groups in RTTY (ARQ), at 1547, again at 1726. (Hall-RSA) 18360.0. KHS-a-French embassy, Kinsasha, with 35-letter code groups for MFA Paris, in RTTY (ARQ, 200/400), at 0930. Same station with 40-minute message to Paris at 0940. (Hall-RSA) 18538.0. NDJ-French embassy, Ndjamena, with French language in RTTY (ARQ, 200/400), at 0940, code groups at 1545. (Hall-RSA) 18661.7. EGY-London embassy, (tentative ID), with 5-letter code message in RTTY (ARQ) at 1148. Kinsasha, with similar, at 1200. (Hall-RSA) 18760.0. RFCW-MFA, Paris, with scheduled transmission in 5-letter code groups, RTTY (FEC-A, 192/400), at 1520. (Hall-RSA) 19721.0. RKL-Marchangelisch Fishery Radio, Russia, calling 4LY in CW, at 1400. (Boender-Netherlands) 19860.0. GYA-Royal Navy, London, with RTTY (Baudot, 75), at 1404. (Boender-Netherlands) 20518.0. KHS-a-French Embassy, Kinshasa, with several messages headed "SVC DIPL de KHSa," in RTTY (ARQ, 200/400), at 1009. (Hall-RSA) 20699.7. SAM-MFA, Stockholm, with traffic to Pretoria, then 5-letter code groups, in RTTY (Swed-ARQ, 100/400), at 1514. (Hall-RSA) 22108.0. Unid-Cherry Ripe numbers format at 0000. Also 15616 and 19884. (Yamaguchi-Japan) 26150.0. Unid-Lowest of Dutch paging signals, every 100 kHz the way to 26850, in data mode, at 1520. (Boender-Netherlands) Oh good, sounds like yet another 10-meter band indicator. -Hugh 26810.0. Unid-Another Dutch paging system, different from 26150 and others, data mode, at 1533. (Boender-Netherlands)
The First Digital Mode — Radioteletype

The Polish language, however, has many additional native characters. A special third shift for Cyrillic (the Russian character alphabet) was developed and is known as Third Shift Cyrillic. Even though most decoding equipment cannot represent Cyrillic characters, the Cyrillic characters do yield complete Latin transliterations. Some decoders, such as the Universal M-7000 and Universal M-8000, can actually display Cyrillic characters on the video monitor.

### The Rise of RTTY

Most RTTY monitors in the hobby originally started listening to the international shortwave broadcasters and gradually began to notice other AM transmissions in the shortwave bands. A limited number of aeronautical stations and numerous cable and wireless transmissions began to appear.

With the introduction of SSB modes, the true digital monitor was born. Increased use of Baudot RTTY on the airwaves saw the introduction of outboard decoders. However, only the strongest and cleanest signals could be decoded by the early AEA, HAL and Kantronics units — more sophisticated monitoring required more expensive equipment, often in the form of surplus commercial hardware.

In the 70's, Infotech introduced its high end/high priced line of decoders. The Wavecom unit was introduced in Europe, but was never promoted successfully in North America. RTTY monitoring continued to be a practice requiring additional peripheral equipment and much experimentation until the 80's.

Perhaps the most significant factor in the rise of popularity of digital communications for the hobby was the introduction of the personal computer. A relatively simple interface, coupled with intelligent software, now provides not only a means of decoding but also of analyzing digital transmissions. As new digital communication protocols are introduced, progressive software engineers can implement new code routines to process them.

With the advent of satellite technology, RTTY monitors lost the myriad of frequencies once used by the major press agencies such as the Voice of America, Associated Press and United Press International. With the demise of the Soviet Union, over 30 former TASS frequencies are now silent.

The largest single user of shortwave RTTY was the former Soviet maritime fleet. How has the Soviet break-up affected RTTY's share in digital communications? An analysis of digital HF signals from over 4,000 reported fixed station frequencies heard in North America during the past 12 months reveals the following mode usage:

<table>
<thead>
<tr>
<th>Mode</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>RTTY</td>
<td>53.7%</td>
</tr>
<tr>
<td>SITOR</td>
<td>20.4%</td>
</tr>
<tr>
<td>ARQ-M</td>
<td>11.1%</td>
</tr>
<tr>
<td>ARQ-E3</td>
<td>9.4%</td>
</tr>
<tr>
<td>ARQ-E</td>
<td>4.5%</td>
</tr>
<tr>
<td>FEC-A</td>
<td>0.7%</td>
</tr>
<tr>
<td>All Others</td>
<td>0.2%</td>
</tr>
</tbody>
</table>

One can see that, despite the services that have now opted for newer communications modes and means of delivery, there is still plenty to monitor for today's digital utility enthusiast.

Although most stations use very low transmitting power in comparison to the international shortwave broadcasters, you will often be amazed at the strength of their signal. One prized North American catch for the broadcast listener is the Voice of Kenya. During the last 30 years, your editor has only heard them twice from his QTH. On the other hand, Nairobi Air and Nairobi Metro deliver a 15 kW RTTY signal every night that will rival that of a local AM radio station! Digital transmissions, because of their signal nature, often have a way of "getting through," especially during poor propagation conditions when the broadcast bands seem dead.

Most of the 75 Baud RTTY transmissions you will encounter are military in nature and are indecipherable. Whenever you encounter an extremely strong 75 baud signal, you can generally assume it is one of Uncle Sam's facilities. Most diplomatic (embassy) communications using RTTY are also encrypted.

You can see that when first starting out in this phase of the hobby, it is just as important to know "what not to listen to." All too often new RTTY monitors are easily discouraged because they are trying to decode the wrong mode or encrypted signals.

With patience and experience you can develop an "ear" for the various modes, and in many cases be able to identify the mode by its sound. Many experienced monitors can even audibly determine the baud rate!

Virtually all decoders, from the most elementary to the most sophisticated, are capable of decoding RTTY transmissions. To get off to a good start with your hamfest hardware or your slick new software, try for these RTTY transmissions which should be easily logged:

- **CH-** Canadian Forces, Halifax
  - 4271.0, 8496.4
  - 10546.0, 13510.0
  - 7263.9
- **SYD-** Nairobi, Kenya
  - 7461.0, 9041.0
  - 10384.6, 17441.5
- **5YE-** Nairobi Metro, Kenya
  - 4570.0, 7510.0
  - 10215.0, 11125.0
  - 17592.1
- **HZN-** Jeddah Metro, Saudi Arabia
  - 3125.0, 5904.0
- **USAOF** Offutt Air Force Base, Omaha, NE
  - 3225.0, 5904.0

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**May 1998**  **MONITORING TIMES**  **33**
BBC, Others Commit to Digital Shortwave

BBC World Service has joined an international consortium in signing an agreement in China to develop standards for digital radio technology, which promises interference-free SW listening, and automatic frequency changing as needed. Digital Radio Mondiale also brings together transmitter and receiver manufacturers, such as Sony, Sangean and Telefunken.

Standards could be ready for ratification by the ITU in two years. Sets would cost about $30 more than conventional SW receivers, and could be in shops by 2003. World Service SW transmitters could be upgraded for less than a quarter kilopound per site, says a BBC press release. The other stations involved are DW, RFI, VOA and RN, says Radio-Enlace.

Caribbean May Return on Shortwave

Aside from Cuban and Dominican Republic relay sites, there has been no SW broadcasting from the Caribbean since the demise of R. Free Grenada. Now Carl Moore, chairman of the Barbados Broadcasting Authority, is calling for a SW service to be established in order to promote the island's development and for the Bajan diaspora.

Two four-hour services in the European and North American evenings would suffice; might cost $1 million to set up but would be well worth it. The Government Information Service should run it, in the last four years there was one application for a SW service, but it was withdrawn, says a story by Barry Alleyne in the Daily Nation via John Ebeling, World of Radio.

Meanwhile, we wouldn't be surprised if there is a radio angle to New Utopia, a new country supposedly under construction beginning in April upon Rosario and/or Misseria Banks (submerged islands) between Cayman and Belize. It's designed as a tax haven, and offers citizenship if not residency for a price paid to Prince Lazarus with an Oklahoma phone number, as interviewed on Talk USA via WHRI, heard by Ernie Behr.

grading the studios in Montreal (Bill Westenhaver, RCI, World of Radio) This means RCI will be switching over in the next three years to brand new digital transmitters; two more recently bought can be converted to digital, with the equivalent of a computer card (Bob O'Reilly, RCI director, on RCI via BBCM)

CHILE. Thanks to a tip from Ron Trotto, I heard Voz Cristina test on 21551 for three days only in early March, from as early as 1335 to as late as 1537 with soft gospel-rock music, IDs in English and Spanish claiming 21550. This is the former Voz de Chile facility, sold and reactivated at last (gh, Ok) Preliminary tests toward Mexico; plans to program from Miami via satellite, powered down to 70 kW (Voz Cristina via Tom Sundstrom)

CHINA. Yunnan PBS General Service on SW now seems off the air, had been on 7210, 4760, 2460, but the minority language service from Kunming is on 6937v on 0355-0545, 1100-1500, 2200-2445 (BBCM)

Guangxi PBS, Nanning, 2200-1600 on 4915. Guangxi Economic Broadcasting, Station, 2200-1600 on 5010 (BBCM)

Ten new transmitters with 500 kW each, and four MW of 600 kW each were installed in Xinjiang and Yunnan. A challenge in 1998 is adjusting the broadcast times of 38 foreign language services, some of which were set 40 years ago (CRI Messenger via Wolfgang Büschel, BC-DX)

CRI on 9900, probably via Urumchi, 1800-2227 in various Euro languages, huge signal since Jan 1, probably 500 kW. NASWA should count Xinjiang as a separate radio country, just like Tibet and Manchuria. Under Soviet control from 1944 to 1994, Xinjiang was known as the Republic of East Turkestan (Ernie Behr, Ont.)

COSTA RICA. RFI expected more changes than usual for its 2nd quarter programming, perhaps 15% retimed, and some new shows. Feminist International Radio Endavoure already in March reduced from daily to three days a week, opening many hours for repeats of other programs. The 30 kw AM on 7385 took a break at 0800-1400, but 6980 USB remained until 1200; then 15505 USB. There were also plans to exchange AM and USB on 6880 and 7385 (gh)

CUBA. From February until mid-March, more than 200 kHz of the 31 meter band was blasted with noise bursts every few seconds, centered on 6950. We suspected it was Radio Havana Cuba's transmitter between 1100 and 1300, and reported this to the DX world. When RHC's Arnie Coro heard about it, he broadcast a vicious personal attack on yours truly, while admitting RHC in fact was the source and the problem had finally been fixed. No thanks for the information nor apology for weeks of interference (gh)

CYPRUS TURKISH. CCA factory in Georgia finished testing new transmitter for R. Bayrak, 6150, March 10, shipped it, should be on air in 30 days (Hans Johnson, Cumbre DX)

ECUADOR. HCJB abruptly dropped 9365 for English to Europe at 0700-0900, following a
IRAQ Iraqi

EGYPT

(BBCM) intermittently 11785, varies 1500 daily English programs about the Grapevine. Harms, relays complaint from Colombia that new [non] Rainbow Radio, 5910, Sun 1000-1100 via Armenia in Armanic gave address. P. O. Box 140144, 50439 Bonn, Germany (Martin Schoech, Germany). FINLAND For 2-98, YLE R. Finland, English to NAM moves to evening, 0200-0230 on 9780, 11990, still in morning at 1230 on 15400 and 11990, but Sundays only (Raimo Vekela, YLE Poro, rec.radio shortwave via radio-escutas). GREECE [non] VOG planned many more relays via VOA Greenville and Delano USA sites for 2-98, including prime-time at last: 0000-0400, 11660-5, 0200-0400, 6125-D. At 1200-1400 on 9955-D, 9730-D, 9775-D, 1800-2200 on 11735-D, and more in the 1200-2200 period. (HFCC via Bob Paula and Matt Francis, Electronic DX Press). GUINEA Rds. Nationale, Conakry, reactivated in mid-March on 9650 //7125, 2330-2430+, also announcing 6155, 15310 (Jay Novello, NC). INDIA Newest AIR transmitter is 50 kw on 6040 testing from Jype, the first in Orissa state, 0700-1000, 1600-1700. May have been the one on 5040 by mistake heard by Vajhjee (Manosij Ghani, DSWCI DX Window and Cumbre DX). Later heard using both (Ghani, Cumbre DX) The SW antenna switching hall in the Kumbiree transmitter site in Dehli is in a state of disrepair (Ghani, DX Grapevine via Cumbre DX). INDONESIA VDI in English at 0100 on 11785 vs Brazil in 11785 14, even better on 99525 and in the clear on USB (Al Quaglieri, NY). IRAN IRIB finally has official homepage online, http://www.irib.de/ Thrsten Koch, DS7WC, is now online (230, gh). [non] V of Southern Azerbaijan (Azeri: Bura Janubi Azerbaijan Sos) is operated by the National and Independent Front of Southern Azerbaijan. This Iranian province borders the Republic of Azerbaijan and is hostile to the Iranian government. The radio is believed to transmit from Iran. Says broadcasts promote the "freedom and the life of the people of Southern Azerbaijan, and to oppose oppression, the struggles of our brothers who live in Northern Azerbaijan (Republic of Azerbaijan), their long standing war with the Armenian enemy who receives help from Iran, programs about our Azeri heritage, our great history and civilization..." Address is Vosa Ltd. Postfach 108, A-1393 Vienna, Austria. Anticipated timeshift for summer: 0515-0615 on 11950, 1530-1630 on 7095 (BBC Monitoring). DTK pinpointed this to the Israel-Jordan/Saudi Arabia area (DARC via BC-DX). One day on Israel's HS channel 12080 or 12075, heard open carrier with Reshet Bet in background, then VOSA signing on. So Israel seems to be right location (Nikolay Pashkevich, Russia, Cumbre DX). An investigative report shows how this could be connected to the Mossad and the Iran-Contra scandal of the 1980s, on the Clandestine Radio Intel web, http://www.qsl.net/ybrbm/vosa.htm VOSA advocates integration with Azerbaijan (Nick Grace C., Cumbre DX). IRAQ Iraq News Agency, IRA, radio-teletype service as monitored in March with timeshifts expected for summer: 0500-2000 exc. Fri, Arabic on 10162.5, 0615-1500 daily English on 14699, both Fl B75 baud. During periods of crisis, Arabic may start as early as 0300; signals alternate between idling and traffic over the entire span. Addr.: IRA, P. O. Box 3084, Salihia, Baghdad (BBCM). R. Iraq Int'l resumed attempts at external service in late Feb (gh) Baghdad, 11735, was transmission day to day, one German was on at 2110-2130, the next 2100-2130. They have managed to put the worst modulation into the air of all stations from the region. Even R. Cairo is better (Harad Kuhl, Germany, Cumbre DX). Strong carrier but poor, distorted audio with English at 0410-0430 on 11785, couldn't tell whether still English afterwards (Brian Alexander, PA). Republic of Iraq R., the main domestic service at 0255-2415 was heard intermittently on 9715 around 0615-1000, 11785 at 1000-1400 in Feb 1997 (BBCM). [non] Among those supporting a R. Free Iraq proposal testifying at a congressional hearing were former CIA director James Woolsey, Republican presidential candidate Steve Forbes, and Secretary of State Madeleine Albright (Nick Grace, Cumbre DX). Republican senators have added $5 million to the DDS authorization bill to be used to establish a R. Free Iraq via Kuwait (Washington Post via Hans Johnson, Cumbre DX).IRELAND [non] RTÉ is relaying on SW the program Worlds Apart on problems in developing countries, to reach thousands of Irish aid workers and missionaries. 13 weeks starting March 10 (Wesley Boyd, RTÉ) Tue 2305 on 9925 to 5AM via Germany, repeated Wed 1330, 12015kus, 15305, 15120 South Africa, 1600 & 1700 11655 via Germany, (via Fenda D’Orsiss). Review of International Broadcasting) Times and frequencies may have shifted from April, especially the original 2300 broadcast, now 2200 (gh). ISRAEL Israel Radio Z-98 on 9975/15755, 11650, 9435, 1030-1055 on 15650, 15640: 1400-1430 on 15755, 15650, 1545-15207 on 11605, 1900-1925 on 15650, 15640, 11605, 11645. Reshet Bet in Hebrew adds two much more powerful transmitters to us at 0100-0300 than we have had for several years, 1390 and 16151 (Donnie Rosenberg) Could that open the door for resuming prime-time English? (gh). Reshet Bet 24h on Internet at http://netvision.net.il/Ilivia Alexandre Dorre, radiolescutes) See also IRAN JORDAN R. Jordan inaugurated a new 6 megawatt building in Amman with modern studios, and started a new service on MW, The Voice of Awakening, Jordanian Armed Forces Radio (BBCM). KOREA NORTH KCBS provincial stations relay Kyongyang except for local programs weekdays around 0500-0600 Chongjin 3880, Hamhung 3220, Pyongyang 3350, Sariwon 2350, Wonsan 3970v, Hyesan 9320, Kangnye 3960. All SW use is sporadic, Kyongyang, 2100-1800 on 11680, 11460, 9665, 6100, 3960, 3350, 3220, 2850, 2350 (BBCM). LIBERIA R. Venities, 0514-0613 on new 5470, tribal African chants, 0558 English ID with frequency (Giovanni Serra, Italy, The Four Winds) Until 2204 in mid-song was still on 3450 (Jay Novello, NC). MALAYSIA V. of Malaysia has Real Audio available at http://asiaconnect.com.my/rntt/ English is at 0700-0825 on 15295, 0750, 6175, preceded by V. of Islam at 0455-0700 (BBCM). MALAY/March-April issue of CR Messenger shows Malo relay again in use, but in English only on 7170, 2000-2130 AM, 2200-2300 EU (Randy Stewart, MO). MALTA [non] V. of Mediterranean relay via Italy for 2-98 expected to be retimed to 0630-0730 Mon-Sat, 0700-1200 Sun. The W-97 frequency was 9660 (Francesco Clemente, BDX-UK) And 2030 via Russia for 2-98 on 12060 Serpukhov/Josef Zimmerman, Germany, Westf German (http://www.americanradiohistory.com). MEXICO XERTA resumed testing 4800.7 in mid-March, with same IDs, same heterodyne with Guatemala, heard at 1330 (BBCM). MONGOLIA The new station on 4790 was expected to start broadcasting this spring, installation was not completed before winter started (Ludo Maes, Cumbre DX) until Mongolian on 4785 2150, 2230 English lesson (Vladimir Titarev, Ukraine, NU via BC-DX) Maybe Hopoh, China, since it relays Beijing minority Mongolian station. MOROCCO RTM seems to have resumed using Tanger transmitters, which had been off for at least a year, such as 10:00 in Arabic on 15345/VBO Breach relay on 15335, still at 1900 mixing with Argentina. And on 17841 strong at 1804 with English ID as "International Service of R. Morocco" (Noel Green, UGK/BaNI, BC-DX). NEW ZEALAND For April, RNZ1 abandoned 15115 completely, switching from 11735 to 17675 around 2100, then 11905 from 0459, and replacing 5700 after 0717 (Sat and Sun 0759) is 9795, but another schedule takes effect May 4 (RNZ2). NIGER After months off the air, the Voix du Sahel was back on 5020 in early March, 1700-1859 (Mahendra Vaghee, Mauritius, DSWCI DX Window) 5020.00 until 2301* on a Sat (Mark Fire, VA, svlakt) -2200* on weekday, while off we could hear Solomon Islands from *1900 (Harad Kuhl, Germany, DSWCI DX Window) via WVCRI? (gh). DX Listening Digest More broadcasting information by country compiled by Glenn Hauser Review of International Broadcasting SW Programming, opinion, equipment, satellite monitoring. Samples $2.50 each (outside North America US $3 or 6 ICRs) 10 issue subscriptions $26 in USA, or both for $49 Glenn Hauser, Box 1684-MT, Enid, OK 73702 May 1998 MONITORING TIMES 35
NIGERIA V. of Nigeria resumed 15120 in early March around 1900 (Ron Trotto, IL). World of Radio's external service is on 7255 and 15120 daily continuously from 0500 to 2300, with English at 0500-0700, 1000-1100, 1500-1700, 1900-2100; also French, Hausa, Swahili, Arabic; and a language you might not recognize, Fulfulde, at 0600-1000, 1300-1400, 2100-2200 (BBCM).

[non] With the help of bearings from several other European monitoring stations, we are now able to confirm that V. of Free Nigeria is coming from Jülich, Germany, rather than Africa. Signals from Germany hit the ionosphere over Africa, then bounce back towards Europe from a southerly direction, hence the false southerly bearings in the UK (Dave Kenny, BBCM, World of Radio) so, watch out for backwards! (gh) VOFN is Sat 1900-2000 on 11645 in English and others, alternates (BBCM) 268 registration on 1205.17, 1225 (WWJülich (Wolfgang Buschel, BC-DX But) on 11645 mentioned new Q2 of 11965 (Nikolay Paskevich, Russia, Cumbre DX).

K. Rudkin on new 11540 at 1913-2001*, lengthy anti-Abacha commentary, soliciting demographic info into (Jay Novello, NC, NASWA Journal) New 11540 is synchronized with old SDB at 1900-2000, definitely also via South Africa (Wolfgang Buschel, Germany, BC-DX). NADECO plans to expand to two hours a day when funds become available (Hans Johnson, Cumbre DX).

NORWAY RNI Z-89 shows lots of out-of-band frequencies on 15 MHz: 15625, 15640, 15650, 15675, 15695, 15705, 15735. And 18950 at 1000, 1600 and 1800. Times for English on Sundays had not been decided in early versions (via Joe Hanlon, Richard Lemke).

PAPUA NEW GUINEA Drought and hydroelectric power shortage may account for absence of some stations: 3205, 3235, 3290, 3335, 3355, 3375 (Anker Peterson, Fiji and New Zealand, DSWCIDX Window). PERU PK 14000, 14125, 14200, 14210. Check on 14000-14210. ID on 4700.6 (Pedro F. Arradategui, Lima). Or Rong used to be on 5323.6, celebrated 7th anniversary in Feb (Takayuki Inoue N., Relampago DX). Then heard on 5323.7 was La Voz de Anta, in Anta, Acobamba, Huamacavilca, on 0550-0640, 1105-1155 with ID, folk music (Arradategui) Probably bought from the transmitter from Orinog (gh)

R. JSV, Huana on 1500-1520 with pentecostal service; had to use USB to avoid Argentina on same frequency (Fernando Vitoria, Venezuela).

PORTUGAL R. Portugal announced in mid-March that its foreign language broadcasts, English, French and Teturm, would be terminated at the end of March; the existing Portuguese services would continue on SW on a restructured schedule. English had been on the air since 1954, and was known as Voice of the West in the 60s and 70s (Roy Baker, via Mike Barracough, World DX Club) What a shame (gh)

RDP Lisbon put distorted signal in band on 21351.85, peaking weekends at 1650 on fundamental 21515, matched by 21678.15. German Amateur Radio Club bandwatch department found the spur (Wolfgang Buschel, BC-DX).

QATAR DOHA on 1500-2005 on 15270 with pentecostal service; had to use USB to avoid Argentina on same frequency (Fernando Vitoria, Venezuela).

ROMANIA RRI has 36 different OSs (Frederica, RRI via Gigi Lytle) Loud roar, hardly any modulation audible on 17850 around 1330 (gh) It’s Romania’s home service (Kai Ludwig, BC-DX).

RUSSIA R. Bashkortostan, Ufa, 4485 at 2200-2100 for summer timing, carries music channel of Russia’s Radio when not carrying its own local programs; in Russian, Bashkir, Tatar (BCBM).

R. Region Tyumen, 2300-2100 on 4855. 4820 (BCBM).

SAUDI ARABIA BSBSA variant frequencies noted at 0300-0600: 9553.56, 9578.70, 9619.42, 9718.36; at 1600 on 11708.23, 11833.51, 12038.48 = 2 x 6091.24 (Wolfgang Buschel, Germany, BC-DX).

SIEGEL LOGLIE SLBS, 3316, back on SW, now reflecting views of the civilian government instead of the Revolutionary Council (SL website via Hans Johnson, Cumbre DX).

SINGAPORE The Merlin SW relay here, once all for BBC, in M-98 added DW at 2200 Indian, 2300 English on 5975. 2-98 adds Switzerland, 1100-1330 on 9180, 1400-1600 on 9575; and Metropolitan Language Service on 2230, 2300 Dutch, 0590, 1130-1330 Indo 11690 (HFC via Bob Patula, Electronic DX Press).

SOMALIA V. of the People on 7035 ex-6870 at 1610 in Arabic, 1700 ID in English (Mahendra Vaghjhei, Mauritius, DSWCIDX Window).

SYRIA Syrian Arab News Agency, RTTY service F18B sound aid on all 11080, 3560 daily; Arabic to RAF on 0000-1100, 1100-1200; on special occasions only, 1500-1800, French/English to Eu 1000-1100, 1400-1500, 1800-1900 (BCBM).

TAHITI RFO noted with greatly improved signals on 15170.0, not drifting, excellent during daytime, maybe on 24h; in Tahitian and French until 0600, then France-Inter relay from Paris, not the same program as on RFI which is Radio-Monde-1. Suspect new transmitter, unlike previous erratic, weak and drifting signal around 15167.5; first discovered by Chris Hamby (Bob Padula, Australia). Sometimes audible here, but rarely in evening. No powerhouse, but better than nothing which was expected (gh)

UK EGBANI BBC WS launched a breakfast news program for Europe March 30, 0330-0600 on MW, and SW 6195, 9140, The World Today for Europe (BBC Press Office)[non] Media Zoo, a media program on CMR via Astra satellite, planned to launch a new weekly show in addition, via Sirius 2 and on SW via the Merlin Network (UK Gold text) in Orbit via Ray Woodward, BDX-UK.

USA FCC has issued WBCQ calls for Allan Weimer’s new SW station in Maine. When it goes on air in late summer, will offer discount rates for free radio broadcasters (Anita McCormick, DXing.com)

WRHA added DXing with Cumbre to its schedule, but it failed to appear Sun 0500 on 0400, did appear Sun 2100 on 15450, the final airing when also on KWHR 17555 (gh) FINOVA officially sold the relay to SW station owner LeSean on March 3 for $1.5 million, lower than the $5 million paid by the previous owner in 1994. FINOVA, a New Jersey-based lender, was forced to foreclose on WWHF last August. WWHF also did not pay property taxes. Tax bills were paid by FINOVA and are now current. The Christian Science Monitor Network contributed between $113K and $120K a year to the town coffers of Greenbush. The station would still be the town’s biggest taxpayer, now an estimated 13% at its $6 million tax assessment. It was unclear if LeSean would seek property tax exemption as well (Bangor Daily News via Owen Williamson).

The expected UT Mon 0400 broadcast of World of Radio on WOCW would be on 5570, not 35270. See latest info (gh)

More on Mother Angela’s conflict with the Vatican; she subsequently claimed to have heard directly from Jesus and Mary endorsing her broadcasting and healing in$content. Los Angeles Cardinal Mahony isn’t buying it (National Catholic Reporter via Owen Williamson, Review of International Broadcasting).

With MUF rising, I’m hearing these remote-profit linkups almost daily, both NBFM, full-quieting with little landing: 25870, WF LA Tampa around 1600; 26470, “Mix 107.1” with Motown, rap, reggae, hiphop, Florida ads around 1600, 2-3 s-units stronger than WEMO (San Hump, AZ)

USIA’s expansion plans for 1998-99 include: shipping transmitters and other equipment from downsized or closed stations to those closest to priority audiences in Africa and Asia; constructing new antennas; adding satellite ground stations; instrumenting energy-saving solid-state modulators at various sites; converting satellite transmission to digital; expanding combined VOA/RFA service to China 24 hours; augmenting the previously planned Tinay relay; purchasing and modifying a privately-owned facility on Saipan (KHBI); expanding audience research. $4M have been earmarked for developing a Farsi-language surrogate broadcasting service to Iran. However, the FY 1999 budget request calls for a reduction in positions. Office of Communications staff dropped from 27 positions to 15, and RTOrelayed via Russia (ibid.)

Voice of America budget for 1999-00 was $1.5 million, lower than the $1.7 million proposed by the FCC.

USIA’s Minority Network (continued)
0000 UTC on 9680
THAILAND: Radio Thailand. National news on Bangkok's future as an international aviation hub for business. Good clear signal throughout the 30 minute broadcast. (Dale Fisher, Cleveland, OH) 4830 at 1503. (Francesco Clemente, Udine, Italy/Radio DX Net)

0101 UTC on 3270.05
NAMIBIA: NBC. Instrumental ballads to announcers chat, SINPO= 24343. (Mark Veldhuis, Borne, Netherlands, Hard Core-DX)

0102 UTC on 11785
INDONESIA: Java Voice of. Woman announcer with English news items on the national economic crisis. Fair signal and gaining strength, battling with Brazil's Radio Guialba on 11785.14. (Al Quaglieri, Albany, NY) RRI-Jakarta (Java) noted at 1500 and 2330 on 11760 kHz. (Zacharias Liangas, Thessaloniki, Greece/Hard Core-DX)

0105 UTC on 5005
NEPAL: Radio Nepal. Talk and commercials with fair signal quality. (Liangs, GRC) Station noted in Nepalase at 1558 with regional music at ID at 1603. (Klaus Elsebusch, Marienthal, Germany; Pierluigi Calligaro, Udine, Italy)

0130 UTC on 4808
GUATEMALA: Radio Buenas Nuevas. Spanish. Religious text and music to 0330*. (Lee Silvi, Mentor, OH)

0130 UTC on 9005
SWITZERLAND: Swiss Radio Intl. Mellow music program to announcements. (Sue Wilden, Columbus, IN) Audible 1405 on 13635. (Moser, IL; Woody, TX; Pope, Garland, TX) 9885, 1000-1030; 6135, 0025-0130. (Albert Arnold, Chesterfield, VA)

0130 UTC on 9730
SRI LANKA: SLBC. English programming with a good variety of music until wiped out by China at 0255 nightly. (Silvi, OH)

0132 UTC on 9820
CUBA: Radio Havana. Programming preview to newscast including item on the Helms-Burton Law, to Time Out program. (Wilden, IN) Heard 0320 on 9820. (Pope, TX; Arnold, VA)

0155 UTC on 4995
PERU: Radio Andina. Spanish comments to ID and religious programming. Other Peruvians noted: Radio Satelite 6725 at 0155; Nacional del Peru 6095 at 0230; Radio Cusco 6203 at 0230; Radio Los Andes 6480 at 0346; Radio Ancash 4991 at 0400. (Enrique Alejandro Wembagher, Buenos Aires, Argentina) Radio Huanta 4747.47 at 2000. (Yoder, PA)

0230 UTC on 7280
SWEDEN: Radio Sweden. National news on Asia's financial woes affecting Sweden's economy. (Joe Wood, Augusta, SC) Station also noted at 1238 on 11650 (Wilden, IN) 1430 on 11650 (Moser, IL) Audible 11735/15400 at 1240. (Fraser, MA) Swedish satellite report on 7115 at 0344. (Pope, TX)

0237 UTC on 4800
LESOTHO: Radio Lesotho. Audible at station sign-on, with interference from Guatemala's Radio Buenas Nuevas. Lesotho fading out by 0505. (Silvi, OH)

0245 UTC on 7160
ALBANIA: Radio Tirana. General news featuring item about Italian immigration laws and cigarette smuggling into Albania. (Wood, SC) 2200-2228 on 6025. (Arnold, VA)

0300 UTC on 7100
RUSSIA: Voice of. Interval signal to sports report. (Sue Wilden, Columbus, IN) Science & Engineering on 5905 at 2115. (Bob Fraser, Cohasset, MA; Moser, IL; Paul Ormandy, NZ)

0422 UTC on 4930
HONDURAS: Radio Internacional. Spanish musical ballads to 0427 ID. Musical QRM from Morse code adjacent to lower sideband, but otherwise nice signal. (Mark J. Fine, Remington, VA)

0441 UTC on 4770
NIGERIA: Radio Nigeria. English newscast News in Brief to national news items. UPC time check into pop music program. (Harold Frode, Midland, MI) Station noted on 6090 at 2225 in Haussa service. (Liangas, Greece/Hard Core-DX) Voice of Free Nigeria heard on 11645, 1900-2000 in English. (Richard J. LaFountain, Paulding, OH; Howard J. Moser, Lincolnshire, IL)

0523 UTC on 6055
SPAIN: Radio Exterior Espana. News on Gallup Polls and Washington, DC, opera series. (Moser, IL; Pope, TX) Mailbag show, news and music 0003-0110 on 6055. (Arnold, VA)

0525 UTC on 7375
BULGARIA: Radio Bulgaria. Sports report with fair signal. (Moser, IL) Station noted on 7530, 2236-2300 with item about King Basil II. (Wood, SC; Arnold, VA)

0539 UTC on 6064.55
COLOMBIA: C plain. Popular Latin music interspersed with announcements by woman. "Canned" ID at 0551, noted frequency down from nominal 6065 kHz. (Fine, VA)

0601 UTC on 9780
YEMEN: Yemen Radio. English news to martial and broadcast summary. Poor-fair quality. (Ormandy, NZ)

1016 UTC on 4562.5
BOLIVIA: Folk accordion music to male DJ's chat to instrumental organ music. (Andrew Yoder, Mont Alto, PA)

1230 UTC on 6120
CANADA: Radio Japan relay. Music Journey Through Asia, featuring music of the various Far East nations. (Bob Fraser, Cohasset, MA) RCI noted on 5975 at 2000-2025. (Arnold, VA)

1245 UTC on 17575
FRANCE: Radio France Intl. Arts in France featuring an exhibition of the late U.S. photographer Dorothy Langhome. (Fraser, MA)

1245 UTC on 13730
AUSTRALIA: Radio Austria Intl. Mailbag program with query on the present status of the 7,000 year old man found in a glacier. (Fraser, MA) 2235-2258 on 1585. (Arnold, VA)

1245 UTC on 5965
BRAZIL: Radio Nova Visao. Portuguese. Music to program comments. Meteorology report to station ID. Brazilian stations audible: Radio Marumby 9665 at 1530; Radio Clube 15415 at 1540; Radio Clube Paraense 9725 at 1545; Radio Nova Visao 11705 at 1900. (Wembagher, ARG)

1423 UTC on 13700
NETHERLANDS: Radio Netherlands. Closeup on quality of food vs large company monopoly in France, Netherlands, and Belgium. (Moser, AL) Feature on progress and improvements in Portugal on 11655 at 1655. (Fraser, MA; Pope, TX; Arnold, VA)

1455 UTC on 4816
CHINA: China Radio Intl. Closing music from Mongolian service, carrier to 1500 with "East is Red" interval signal. Chinese ID into Russian service. China's CPBS noted at 1613 on 5090; 1615 on 5205; 1620 on 5250. (John MacDonald, Poulsbo, WA)

1522 UTC on 4003.5
INDONESIA:(Sulawesi) RRI-Padang. Indonesian. Regional music interrupted by sign-off announcement, 1600*. Indo's RRI-Tanjungkarang (Sumatra) audible on 1528, with gamelan music, I.S., and newscast. Heard at 1649. (Willi H. Passmann, Muelheim, Germany/Hard Core-DX)

1526 UTC on 13730
PHILIPPINES: Radio Veritas. Russian to Central Asia. Music segments with ID/frequency quote and time check in English. (Stokes Schwartz, Madison, WI)

1815 UTC on 9630
SEYCHELLES: BBC. English lessons to 1830 newscast. Radio FBEA in French to Africa at 9500 on 1830-1903*. (Silvi, OH)

1830 UTC on 12095
UNITED KINGDOM: BBC World Service. Play of the Week-Plantation, about Pocahontas and Jamestown. (Fraser, MA)

1945 UTC on 4545
KAZAKHSTAN: Radio Almaty. Continuous English music to 2000 ID by lady. National anthem to sign-off. (Mahendra Vaghjee, Rose Hill, Mauritius) Radio Kazakh noted on 5905 at 0205 (Wembagher, ARG); 11640 at 0505. (Ormandy, NZ)

2011 UTC on 5540
TURKEY: Voice of Bizarre pseudo-news items, announced as, As the World Turns at 2015. Mediterranean style music to ID at 2205. (Fine, VA; Paul Ormandy, NZ)Turkish service on 7185 at 0017, //9445, 5980, 9460. (Zacharias Liangas, NY) VOT programming in English 1730 to 2320. (Fraser, MA; Pope, TX; Arnold, VA)

2254 UTC on 5020
NIGER: LV du Sahel. French. Popular music to 2255, followed by announcer's chat and recitations to 2255. Closing announcement to anthem and 2301*. (Fine, VA)

2300 UTC on 13760
NORTH KOREA: Radio Pyongyung. Report on world celebrations for Kim Jong Il's 50th birthday. (Fraser, MA) Noted on 2850, 2055-2100+. (Passmann, Germany; Ormandy, NZ)

2348 UTC on 4935.4
VENEZUELA: Radio Amazonas. Latin music to Spanish advertisements. ID format, SINPO=24343. (Vendhuis, NLD)

Thanks to our contributors — Have you sent in YOUR logs? Send to Gayle Van Horn, c/o Monitoring Times (or e-mailgayle@grove.net) English broadcast unless otherwise noted.
Transmitter Documentation Project Returns

Detailed information is available about the transmitters used by shortwave radio stations around the world in the fifth edition of TDP SW-98—the Transmitter Documentation Project—now sporting a color cover and advertising. TDP is an 80 page booklet listing broadcast transmitters worldwide, arranged by country. Each listing indicates the name of the station, transmitter site, geographical coordinates and callsign. TDP also lists the number of transmitters at the site, their power, manufacturer, type number, year of installation, and year out of service.

This year’s feature articles include, HF

ASCENSION ISLAND
BBC Atlantic Relay Station, 15400/7325 kHz. Full data verification letter signed by Nicola Nicholls-Transmitter Engineer, plus personal letter and info sheet about the isaland. Received in 123 days for a taped report. Station address: BBC Atlantic Relay Station, Ascension Island, South Atlantic Ocean. (Walter Szczeniowski, Philadelphia, PA; William R. Wilkins, Springfield, MO)

Voice of America relay, 15225 kHz. Full data Hawaii scannery card unsigned. Received in 21 days for an English report. Station address: 330 Independence Ave., SW., Washington, DC 20547 (Darren R. White, Hattiesburg, MS)

FINLAND
Radio Finland, 11735 kHz. Full data verification letter signed by Ranmo Makela, plus station stickers. Received in 47 days for a taped report. Station address: PL 113, 28101 Porvoo, Finland. (Szczeniowski, PA)

FM/TV
WJBR-FM 99.5. Full data verification letter signed by Dave Banks, plus personal letter and station bumper stickers. Received in 25 days for an FM report. Station address: 3001 Philadelphia Pike, Claymont, DE 19703 (Jose Moura, Washington, DC)

KTXN-FM 98.7. Full data prepared QSL card signed by Peter B. Hoehn-Engineer. Received in two months for an FM report and mint stamps. Station address: Willow Broadcasting Company of Texas, 3808 N. Navarro, Victoria, TX 77904. (Robert S. Ross, London, ON Canada/AmFmTvDx)

WKOL-AM 96.7. Full data prepared QSL card signed by Harry J. Monroe-Engineer. Received in two months for a TV report and mint stamps. Station address: Trinity Broadcasting of Indiana, 1702 South 9th St., Richmond, IN 47374. (Ross, CAN)

CHCH-TV Ch. 3. Full data prepared QSL card and personal letter signed by Peter Blockland, plus complete set of color contour maps for all of On TV’s Ontario transmitters. Received for a TV report and mint stamps. Station address: On TV, P.O. Box 2230 Station A, Hamilton, ON Canada L8N 3A6. (Ross, CAN)

KENYA
KBC, 4935 kHz. Full data prepared card signed by Martin Ouma Ojwach-Engineer in Charge. Personal letter on KBC letterhead enclosed. Received in 87 days for an English report, SAE (used for reply) and one U.S. dollar. Report sent to transmitter site and not to Nairobi office. Station address: KBC Maralal Transmitting Station, P.O. Box 38, Maralal, Kenya. (Randy Stewart, Springfield, MO)

MEDIUM WAVE
WPHG-AM 1620. Frequency only form letter/folder unsigned. Received in 16 days for an English AM report faxed to 334-366-9495. Mailing address: Maranatha Ministries Inc., 805 N. Main St., Aimore, AL 36502. (Stewart, MO)

CKDM-AM 730. Station QSL card unsigned. Received in 17 days for an English AM report and one U.S. dollar. Station address: 273rd Ave., N.E., Dauphin, MB Canada R7N 0Y5 (Patrick Griffith, Federal Heights, CO)

CTKA-AM 1570. Full data prepared card and verification letter signed by Tyler Everett-Engineer. Received in 60 days for an English AM report and mint stamps. Station address: 401 Mayor Magrath Dr., Lethbridge, AB Canada T1J 3L8. (Terry Jones, Plankinton, SD)

RUSSIA
Voice of Russia, 9640 kHz. Full data QSL card, extra Moscow postcards and letter signed by Eugene Speranova. Received in 47 days for an English report. Station address: at Pyatnitskaya 25, Moscow. (Ed Luntley, Portland, ME)

SAO TOME
Voice of America relay, 6035 kHz. Full data Hawaii scannery card unsigned. Received in 24 days for a taped report and one U.S. dollar (both returned) Station address: (same as Ascension Island) (Szczeniowski, PA)

SATELLITE SERVICES
Radio Netherlands via U.K. 's World Radio Network One. C-band service-domestic satellite Galaxy 5/transponder 6, audio subcarrier 6.80 MHz. Full data Radio Netherlands's station card unsigned, souvenir stickers, two cloth pennants and souvenir postcard. Received in 48 days for one IRC and detail of satellite broadcast via WLM's broadcast: monitored on home C-band dish. Station address: Radio Netherlands. P.O. Box 222, 2200 JG Hilversum. The Netherlands. (Gayle Van Horn, Brassoort, NC)

SHIP TRAFFIC
Kydonia-PGB, 156.600 MHz (Bulk Carrier). Full data prepared QSL card verified and stamped with ship's seal. Received for an English report. one IRC, SAE, mint stamps and one U.S. dollar. Ship address: Marfanus Navigation Ltd., 4-6 Fileimon St., 185 36 Piraeus, Greece. (Russ Hill, Oak Park, MI)

Zienia Tarnowska-SQND, 156.600 MHz (Bulk Carrier). Full data prepared QSL card verified and stamped with ship's seal. Received for an English report. one IRC, SAE, mint stamps and one U.S. dollar. Ship address: Polish Steamship Co, (Polisha Zezgula Morska) Plac Rodka 8, P.O. Box 527, 70-419 Szczecin, Poland. (Hill, MI)

UNITED STATES
KAI, 5810kHz. Full data Two If by Sea logon card signed by Fred Bihell. Received in 275 days for an English report and a SASE. Station address: Two If by Sea Broadcasting Corp., 22720 S.E. 410th St., Enumclaw, WA 98022. (White, MS)

USCG CAMSLANT/NNM, 6501 kHz USB. Full data station QSL signed by TCC Thomas F. Sherwood. Received in 16 days for an English report, mint stamps and address label (both used) Station address: Command Officer, USCG CAMSLANT, 4720 Milepost Rd., Chesapeake, VA 23322. (Wilkins, MO)

Voice of America-Declaro 13740 kHz. Full data Yellowstone scannery card unsigned. Received in 24 days for an English report. Station address: (same as Ascension Island) (White, MS)
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 or Pacific Times, respectively.

Note that all dates, as well as times, are in UTC; for example, a show which might air at 0030 UTC Sunday will be heard on Saturday evening in America (8:30 pm Eastern, 5:30 pm Pacific).

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.
   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 latter 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 of the time on all frequencies. To help you find the most promising frequency, we’ve included information on the target area of each broadcast. Frequencies beamed toward your area will generally be easier to hear than those beamed elsewhere, even though the latter will often still be audible. Every frequency is followed by one of these target codes:

am: The Americas  na: North America  as: Asia
ca: Central America  au: Australia
sa: South America  pa: Pacific
eu: Europe  vs: various
da: 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.

SWL PROGRAMS

Sundays
0024 Radio Exterior de Espana: “Distance Unknown”
0030 BBC (as): “Write On”
0100 HCJB (am): “DX Partyline”
0124 Radio Exterior de Espana: “Distance Unknown”
0200 Radio For Peace Intl: “World of Radio”
0234 Radio Havana Cuba: “DXers Unlimited”
0258 Vatican Radio: “On-the-Air”
0306 WWCR #3 (Tennessee): “World of Radio”
0330 Australian Radio: “Feedback”
0333 Voice of Turkey: “DX Corner” (biweekly)
0330 WRMI (Florida): “Wavescan”
0400 HCJB (am): “On-the-Air”
0447 Radio Bulgaria: “Radio Bulgaria Calling”
0500 WRFA (Angel 5 Maine): “DXing with Cumbré”
0624 Radio Exterior de Espana: “Distance Unknown”
0630 WRHI (Angel 2 Indiana): “DXing with Cumbré”
0630 Austria, Radio: “Media Report”
0658 Vatican Radio: “On-the-Air”
0634 Radio Havana Cuba: “DXers Unlimited”
0730 WRHR (Angel 4 Hawaii): “DXing with Cumbré”
0639 WWCR #3 (Tennessee): “World of Radio”
0735 Radio Vlaanderen Intl: “Radio World”
0836 Radio Korea: “Multwave Feedback”
0900 Radio For Peace Intl: “World of Radio”
0905 BBC (as): “Write On”
0930 WRHI (Angel 2 Indiana): “DXing with Cumbré”
1100 AWR Latin America: “Wavescan”
1115 WWCR #1 (Tennessee): “Ask WWCR”
1138 Radio Korea: “Multwave Feedback”
1147 Radio Bulgaria: “Radio Bulgaria Calling”
1205 BBC (as): “Write On”
1205 BBC (as): “Write On”
1207 Radio Vlaanderen Intl: “Radio World”
1236 Radio Korea: “Multwave Feedback”
1300 WWCR (Angel 4 Hawaii): “DXing with Cumbré”
1330 WRHI (Angel 1 Indiana): “DXing with Cumbré”
1300 WWKI (Florida): “Wavescan”
1354 Vatican Radio: “On-the-Air”
1430 WRHI (Angel 1 Indiana): “DXing with Cumbré”
1515 BBC (af): “Wavescan” (4)
1630 WRHI (Angel 3 Hawaii): “DXing with Cumbré”
1630 Radio Vlaanderen Intl: “Radio World”
1636 Radio Korea: “Multwave Feedback”
1735 BBC (as): “Write On”
1735 Radio Vlaanderen Intl: “Radio World”
1830 KCWR (Angel 3 Hawaii): “DXing with Cumbré”
1930 Radio Korea: “Multwave Feedback”
2030 WRHI (Florida): “Wavescan”
2105 BBC (as): “Write On”
2130 KCWR (Angel 4 Hawaii): “DXing with Cumbré”
2300 Radio For Peace Intl: “World of Radio”
2300 Australia, Radio: “Media Report”
2330 KSWR (Angel 4 Hawaii): “DXing with Cumbré”
2347 Radio For Peace Intl: “World of Radio”
2355 WWCR #1 (Tennessee): “Ask WWCR”
2355 WWCR #3 (Tennessee): “World of Radio”
2357 World Radio: “World of Radio”
2357 Radio For Peace Intl: “DXers Corner” (2/4)
1130 Radio New Zealand Intl: “Mailbox” (1/3)
1615 KTW (Guam): “Pacific DX Report”
1840 All India Radio: “DXers Corner” (2/4)
2139 All India Radio: “DXers Corner” (2/4)
2100 WWCR #1 (Tennessee): “Ask WWCR”

Tuesdays
0030 BBC (as): “Wavescan” (4)
0090 KTW (Guam): “Pacific DX Report”
1245 Radio Sweden: “MediaScan” (1/3)
1239 WWCR #1 (Tennessee): “World of Radio”
1346 Radio Sweden: “MediaScan” (1/3)
1355 FCB (Philippines): “DX Dial”
1745 Radio Sweden: “MediaScan” (1/3)
1900 Radio For Peace Intl: “World of Radio”
2000 Polish Radio: “Polish Radio DX Club”
2111 Radio Havana Cuba: “DXers Unlimited”
2311 Radio Havana Cuba: “DXers Unlimited”
2340 All India Radio: “DXers Corner” (2/4)

Wednesdays
0140 Radio Havana Cuba: “DXers Unlimited”
0146 Radio Sweden: “MediaScan” (1/3)
0246 Radio Sweden: “MediaScan” (1/3)
0300 Radio For Peace Intl: “World of Radio”
0335 Radio Havana Cuba: “DXers Unlimited”
0346 Radio Sweden: “MediaScan” (1/3)
0355 Radio Havana Cuba: “DXers Unlimited”
0730 HCJB (as): “Ham Radio Today”
0730 BBC (as): “Wavescan” (4)
0930 BBC (as): “Wavescan” (4)
1345 Argentinia, RA: “DXers Special”
1350 HCJB (as): “Ham Radio Today”
1400 Radio For Peace Intl: “World of Radio”
1415 FCB (Philippines): “DX Dial”
1420 Polish Radio: “Polish Radio DX Club”
1630 Argentinia, RA: “DXers Special”
1730 Argentinia, RA: “DXers Special”
1800 Radio For Peace Intl: “World of Radio”
1800 WWCR #1 (Tennessee): “Ask WWCR”
2105 Australia, Radio: “Feedback”
2338 Voice of Turkey: “DX Corner” (biweekly)
2344 Radio Bulgaria: “Radio Bulgaria Calling”

Saturdays
0010 Australia, Radio: “Feedback”
0015 WRMI (Florida): “Wavescan”
0035 HCJB (Angel 3 Hawaii): “DXing with Cumbré”
0035 Radio For Peace Intl: “Continent of Media”
0038 Voice of Turkey: “DX Corner” (biweekly)
0040 Radio For Peace Intl: “World of Radio”
0050 WRHI (Angel 1/2 Indiana): “DXing with Cumbré”

(Continued on P. 42)
### FREQUENCIES

| 0000-0100 | Anguilla, Caribbean Beacon | 660am | 0000-0100 | Australia, Radio | 0630am |
| 0000-0100 | Australia, VLB Katherine | 0920am |
| 0000-0100 | Australia, VLBT Trellick | 0910am |
| 0000-0100 | BBC, Canada, CFC Radio | 0820am |
| 0000-0100 | Canada, CFRX Toronto | 0700am |
| 0000-0100 | Canada, CFV Calgary | 0530am |
| 0000-0100 | Canada, CKNX Halifax | 0610am |
| 0000-0100 | Canada, CKNZ St John’s | 0600am |
| 0000-0209 | Canada, CKUZ Vancouver | 0610am |
| 0000-0030 | Canada, CFCF Vancouver | 0610am |
| 0000-0030 | Czech Rep, Radio Prague | 0730am |
| 0000-0030 | Ecuador, HCJ | 0745am |
| 0000-0030 | Egypt, Radio Cairo | 0900am |
| 0000-0030 | Germany, Deutschlandfunk | 0840am |
| 0000-0030 | Ghana, Ghana National Corp | 0415am |
| 0000-0045 | India, All India Radio | 0700am |
| 0000-0015 | Japan, Japan NHK | 0700am |
| 0000-0010 | Liberia, Liberia | 0700am |
| 0000-0030 | Malaysia, Radio | 0720am |
| 0000-0030 | Netherlands, Radio | 0602am |
| 0000-0010 | New Zealand, New Zealand | 0715am |
| 0000-0010 | Korea, Korea | 0730am |
| 0000-0010 | North Korea, Radio Pyongyang | 0730am |
| 0000-0030 | Pakistan, Radio Peshawar | 0700am |
| 0000-0030 | Portugal, Radio | 0715am |
| 0000-0030 | Singapore, Radio | 0610am |
| 0000-0030 | Solomon Islands, Radio | 0502am |
| 0000-0030 | Spain, Spain | 0605am |
| 0000-0030 | Thailand, Radio | 0955am |
| 0000-0030 | UK, BBC Asian Service | 0915am |
| 0000-0030 | UK, BBC World Service | 0915am |

### SELECTED PROGRAMS

#### Sundays

**0000** UK, BBC London (am-eus): Newsdesk. World news and dispatches from overseas and UK correspondents.


**0030** UK, BBC London (am-eus): Write On. Air your views about World Service, write to PO Box 76, Bush House, Strand, London WC2B 4PH.

**0240** UK, BBC London (am-eus): Science View. A look at complex issues and the implications of the latest research findings.


#### Mondays

**0000** UK, BBC London (am-eus): Chimes of Big Ben (1). Hear the famous chimes at this time on the first Monday of each month.


**0045** UK, BBC London (am-eus): Britain Today. See S 0045.

#### Tuesdays


**0010** USA, VOA Washington DC (am-eus): American Gold. Fifty minutes of classic pop music hosted by Ray Freeman.


**0045** UK, BBC London (am-eus): Britain Today. See S 0045.

**0045** USA, VOA Washington DC (am): Science in the News (Special English). Recent scientific developments.

**0045** USA, VOA Washington DC (am): Report to the Caribbean. See Carib 0030.

**0045** USA, VOA Washington DC (am): Environment Report (Special English). A five-minute report on a specific environmental subject.

**0045** USA, VOA Washington DC (am): Britain Today. See S 0045.

**0045** USA, VOA Washington DC (am): American Mosaic (Special English). Reports about music, books, movies, and student life in the USA.

#### Fridays


**0010** USA, VOA Washington DC (am): VOA News. See Carib 0000.


**0045** USA, VOA Washington DC (am): VOA News. See Carib 0030.

**0045** USA, VOA Washington DC (am): Environment Report (Special English). A five-minute report on a specific environmental subject.

**0045** USA, VOA Washington DC (am): Britain Today. See S 0045.

**0045** USA, VOA Washington DC (am): American Mosaic (Special English). Reports about music, books, movies, and student life in the USA.

#### Saturdays


**0010** USA, VOA Washington DC (am): VOA News. See Carib 0000.


**0045** USA, VOA Washington DC (am): Environment Report (Special English). A five-minute report on a specific environmental subject.

**0045** USA, VOA Washington DC (am): Britain Today. See S 0045.

**0045** USA, VOA Washington DC (am): American Mosaic (Special English). Reports about music, books, movies, and student life in the USA.
### Frequencies

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<thead>
<tr>
<th>Time</th>
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<td>0100-0200</td>
<td>Australia, Radio</td>
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<td>0100-0200</td>
<td>Australia, VLB Katherine</td>
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<td>0100-0200</td>
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<td>0100-0200</td>
<td>Canada, CFX Toronto</td>
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<td>USA, WYDR Raleigh</td>
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<td>0100-0200</td>
<td>Vatican State, Vatican R</td>
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### Selected Programs

#### Sundays

- **0100**: UK, BBC London (as): World News. Broadcast on the hour on S, T, or 15 minutes in length.
- **0110**: UK, BBC London (as): Pause for Thought.
- **0115**: UK, BBC London (as): Health Matters. Keeps track of new developments in the world of medical science, as well as where medical help is needed.
- **0130**: UK, BBC London (as): Variable Feature. Special features and new series.

#### Mondays

- **0110**: UK, BBC London (as): Pause for Thought. See S 0110.
- **0115**: UK, BBC London (as): The Farming World. See S 0815.
- **0130**: UK, BBC London (as): Pick of the Week. Daire Breen celebrates the diversity and range of BBC output by picking her favorite choice from the previous week for you to hear again.

#### Tuesdays

- **0110**: UK, BBC London (as): Pause for Thought. See S 0110.
- **0115**: UK, BBC London (as): Insight. See M 1645.
- **0130**: UK, BBC London (as): Seven Days. See M 0615.
- **0145**: UK, BBC London (as): Variable Feature. See S 0130.

#### Wednesdays

- **0110**: UK, BBC London (as): Pause for Thought. See S 0110.
- **0110**: UK, BBC London (as): Pause for Thought. See S 0110.
## Selected Programs

### Sundays

<table>
<thead>
<tr>
<th>Time</th>
<th>Station</th>
<th>Frequency</th>
<th>Language</th>
<th>Information</th>
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</thead>
<tbody>
<tr>
<td>0200-0300</td>
<td>UK, BBC London (af/am/aeu): Newday</td>
<td>6050am</td>
<td>English</td>
<td>Coverage of the breaking stories and a background briefing on the major news stories of the day.</td>
</tr>
<tr>
<td>0200-0530</td>
<td>UK, BBC London (as): Letter from America</td>
<td>7575am</td>
<td>English</td>
<td>See S 0009.</td>
</tr>
<tr>
<td>0200-0530</td>
<td>Vatican Radio, Vatican Radio: The Popes and the People</td>
<td>7455am</td>
<td>Italian</td>
<td>Recent public statements by the Pope and responses from the man on the street.</td>
</tr>
<tr>
<td>0200-0530</td>
<td>Vatican Radio, Vatican Radio: The View From the Tiber</td>
<td>7455am</td>
<td>English</td>
<td>A look at the views from the Tiber.</td>
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<td>7455am</td>
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<td>English</td>
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### Mondays

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<tr>
<th>Time</th>
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<tbody>
<tr>
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<td>UK, BBC London (af/am/aeu): Newday</td>
<td>6050am</td>
<td>English</td>
<td>Coverage of the breaking stories and a background briefing on the major news stories of the day.</td>
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<tr>
<td>0200-0530</td>
<td>UK, BBC London (as): The Works</td>
<td>7455am</td>
<td>English</td>
<td>Alan Lewis looks at the impact of tomorrow's technology.</td>
</tr>
<tr>
<td>0200-0530</td>
<td>Vatican Radio, Vatican Radio: The Popes and the People</td>
<td>7455am</td>
<td>English</td>
<td>Recent public statements by the Pope and responses from the man on the street.</td>
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<td>7455am</td>
<td>English</td>
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### Tuesdays

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<td>0200-0500</td>
<td>UK, BBC London (af/am/aeu): Newday</td>
<td>6050am</td>
<td>English</td>
<td>Coverage of the breaking stories and a background briefing on the major news stories of the day.</td>
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<td>English</td>
<td>Recent public statements by the Pope and responses from the man on the street.</td>
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### Wednesdays

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<tbody>
<tr>
<td>0200-0530</td>
<td>Vatican Radio, Vatican Radio: The Rome Report</td>
<td>7000am</td>
<td>Italian</td>
<td>A behind-the-scenes view of events currently confronting the church and the world.</td>
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</table>

### Thursdays

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<tbody>
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<td>0200-0530</td>
<td>UK, BBC London (af): Assignment</td>
<td>7000am</td>
<td>English</td>
<td>A look at the Pope and the People.</td>
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<tr>
<td>0200-0530</td>
<td>Vatican Radio, Vatican Radio: The Popes and the People</td>
<td>7000am</td>
<td>English</td>
<td>Recent public statements by the Pope and responses from the man on the street.</td>
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<tr>
<td>0200-0530</td>
<td>Vatican Radio, Vatican Radio: The View From the Tiber</td>
<td>7000am</td>
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### Fridays

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<tr>
<td>0200-0530</td>
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### Saturdays

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<td>0200-0530</td>
<td>UK, BBC London (af): Assignment</td>
<td>7000am</td>
<td>English</td>
<td>A look at the Pope and the People.</td>
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<tr>
<td>0200-0530</td>
<td>Vatican Radio, Vatican Radio: The Popes and the People</td>
<td>7000am</td>
<td>English</td>
<td>Recent public statements by the Pope and responses from the man on the street.</td>
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</table>
0310  UK, BBC London (af/am/as/eu): World Business Review. A look back at the previous week's business and a preview of upcoming events.
0315  UK, BBC London (af/am/as/eu): Africa Quiz (T). A monthly test of the viewer's knowledge of Africa.
0325  UK, BBC London (af/am/as/eu): Your Round. From Our Own Correspondent. BBC correspondents comment on the background to the news.
0330  UK, BBC London (af/am/as/eu): Global Business. NEW! Roger White presents this weekly series of interviews, features and discussions with the movers and shakers of the international business community.

Sundays
0310  UK, BBC London (af/am/as/eu): World Business Review. A look back at the previous week's business and a preview of upcoming events.
0315  UK, BBC London (af/am/as/eu): Africa Quiz (T). A monthly test of the viewer's knowledge of Africa.
0325  UK, BBC London (af/am/as/eu): Your Round. From Our Own Correspondent. BBC correspondents comment on the background to the news.
0330  UK, BBC London (af/am/as/eu): Global Business. NEW! Roger White presents this weekly series of interviews, features and discussions with the movers and shakers of the international business community.

Mondays

Tuesdays

Wednesdays

Thursdays
<table>
<thead>
<tr>
<th>FREQUENCIES</th>
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<tbody>
<tr>
<td>0400-0500 as Angola, Caribbean Beacon 0609am</td>
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<td>0400-0500 as Armenia, Voice of 4810am</td>
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<tr>
<td>0400-0500 as Australia, Radio 15510pa 17579pa</td>
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<tr>
<td>0400-0500 as Australia, Reflecto 15655am 15665am 15705am 15715am</td>
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<td>0400-0500 as Austria, 0500vi as Belgrad, R Belgrad Int'l 7105eu 7210eu</td>
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<td>0400-0500 as Canada, CKN Canada Int'l 6150me 9655me 9845me</td>
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<td>0400-0500 as China, China Radio Int'l 9500do</td>
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<tr>
<td>0400-0500 as Tajikistan, Radio Oshchane 7245as</td>
</tr>
</tbody>
</table>

| SELECTED PROGRAMS |

**Sundays**
0400 | Switzerland, Swiss R Int'l: News: Five minutes of world news. |
0405 | Switzerland, Swiss R Int'l: Newsnet. Analyses of the main international stories by Swiss-based specialists. |
0415 | Switzerland, Swiss R Int'l: Capital Letters (2/4). SRI's SOMMERTIME! mailbag and listener contact program. |
0455 | Switzerland, Swiss R Int'l: The Name Game (1). A chance for you to test your knowledge of Switzerland and win prizes. |
0500 | Switzerland, Swiss R Int'l: Rendez-vous with Switzerland. A relaxing blend of music, interviews. |
0530 | UK, BBC London (as): From Our Correspondent. See S 0300. |

**Mondays**
0400 | Switzerland, Swiss R Int'l: News: Five minutes of world news. |
0415 | Switzerland, Swiss R Int'l: Newsnet. See S 0405. |
0430 | Switzerland, Swiss R Int'l: Rendez-vous with Switzerland. Examines thoroughly a topical aspect of the international scene. |
0445 | Switzerland, Swiss R Int'l: Newsnet. See S 0455. |

**Tuesdays**
0400 | Switzerland, Swiss R Int'l: News: Five minutes of world news. |
0405 | Switzerland, Swiss R Int'l: The World Today. See M 0400. |
0415 | Switzerland, Swiss R Int'l: Rendez-vous with Switzerland. See S 0430. |
0505 | UK, BBC London (am): Take Five. See T 0455. |

**Wednesdays**
0400 | Switzerland, Swiss R Int'l: News: Five minutes of world news. |
0505 | UK, BBC London (am): This Week and Africa. A roundup of the week's political developments across the continent. |
Sundays
0500 Ecuador, HCJB Guato (am): Musical Mailbag. HCJB staffers have a good time reading listener letters and playing music.
0500 Ecuador, HCJB Guato (am): Afterglow. Don Johnson plays religious music.
0500 UK, BBC London (af): Play of the Week. (Am) A different radio drama program each week (alternative programming for the Americas).

Mondays
0500 Ecuador, HCJB Guato (am): Radio Reading Room. Readings from new Christian books.
0500 Ecuador, HCJB Guato (am): The Sower. Michael Guido presents music and inspiration.
0500 UK, BBC London (af/am/as). See M 0300.
0500 UK, BBC London (am/eu): The Works. See M 0300.
0500 UK, BBC London (eu): Europe Today. All the latest news, analysis and comment.
0500 Ecuador, HCJB Guato (am): Science, Scripture and Salvation. Proving scientific principles with the Bible.

Tuesdays
0500 Ecuador, HCJB Guato (am): The Least of These. Ken MacHarg focuses on human needs around the world.

Wednesdays
0515 Ecuador, HCJB Guato (am): The Book and the Spade. The quest for biblical knowledge through a chronology.
0530 UK, BBC London (am): World of Football. Behind the scenes in the World Cup competition.
0530 UK, BBC London (as): The World Today. See M 0400.

Thursdays
0530 Ecuador, HCJB Guato (am): Waller!” in the Sunshine. Don Johnson presents music and inspiration.
0530 UK, BBC London (af/am): Assignment. See M 0300.
0530 UK, BBC London (as): Focus on Faith. See S 0200.
<table>
<thead>
<tr>
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<td>Solomon Islands, SBIC</td>
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</tbody>
</table>

Selected Programs:

- **Sundays**
  - 0830: UK BBC London (as): Mendon. A topical program about the world of the arts featuring books, a live report about theater, or a special event. See S 0635.

- **Mondays**

- **Tuesdays**

- **Wednesdays**

- **Thursdays**

- **Fridays**

- **Saturdays**

- **Hauser's Highlights**
  - **CROATIA: ZAGREB**
    - Z98 registrations for Zagreb, 100 kW: 5 kHz
    - UTC
    - 5900: 1600-1900
    - 6025: 0600-1200
    - 6145: 0400-0600
    - 7125: 1200-1800
    - 7185: 0600-1200
    - 9830: 0500-1600

[www.americanradiohistory.com](http://www.americanradiohistory.com)
<table>
<thead>
<tr>
<th>Frequency</th>
<th>Country/Program</th>
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<tr>
<td>0700-0800</td>
<td>Anguilla, Caribbean Beacon</td>
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<td>0800-0900</td>
<td>South African Radio 702</td>
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<td>Anguilla, Caribbean Beacon</td>
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<td>Australia, Vyatka</td>
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</tbody>
</table>
**Sundays**


**Mondays**

1140 UK, BBC London (as): Mandarin On Screen. See M 1110.
1145 UK, BBC London (as): The Learning Zone (SAs). See S 1515.

**Tuesdays**

1140 UK, BBC London (as): Mandarin On Screen. See M 1110.
1145 UK, BBC London (as): The Learning Zone (SAs). See S 1515.

**Wednesdays**

1130 UK, BBC London (as): Mandarin On Screen. See M 1110.
1135 UK, BBC London (as): The Learning Zone (SAs). See S 1515.
1200-1300 Algeria, R Algiers Intl 11715am 15160am
1200-1300 Angola, Cnr Obion Beacon 11755am
1200-1300 Australia, Radio 5995pa 6020pa 6080as 9500pa
1200-1300 Africa, VLBA Alice Sng 2315am
1200-1300 Africa, VLKB Katerine 2485am
1200-1300 Africa, VLBT Tsent Krc 2435am
1200-1300 Brazil, Radio Bras 15445am
1200-1300 Canada, CBC TV Quebec 9265am
1200-1300 Canada, CFRK Toronto 6070am
1200-1300 Canada, CPB Calgary 6033am
1200-1300 Canada, CICH Halifax 6170am
1200-1300 Canada, OKN St John's 6160am
1200-1300 Canada, CKVU Vancouver 6160am
1200-1300 Canada, R Canada Intl 615as 11730as
1200-1300 China, China Radio Intl 6995as 7385as 9565as 9175as
1200-1300 China, China Radio Intl 9945as 11600as 11675as 11980as
1200-1300 Costa Rica, R Peace Intl 6965am 1505am 2145am
1200-1300 Ecuador, HCJB 1205am 2151am
1200-1300 Eritrea, Eritrea 1516as
1200-1300 Eritrea, Radio Africa 9530as
1200-1300 France, Radio France Intl 9835eu 11600as 13625as 15155as
1200-1300 France, Radio France Intl 15195eu 15450as 17575as
1200-1300 Gibraltar, R Gibraltar 15205as
1200-1300 Indonesia, R Indonesia 1200
1200-1300 Iran, VDRI 9695as 11830as 11875as 13605as
1200-1300 Italy, IRRS 7120a
1200-1300 Jordan, Radio 11696us
1200-1300 Malaysia, Radio 7305as
1200-1300 Myanmar, R Ministry of Information 5800as
1200-1300 Netherlands, Radio 6045clusive
1200-1300 New Zealand, R NZ Intl 9795pa
1200-1300 Pakistan, Radio Pakistan 9895as
1200-1300 Palau, KHIB Voice of Hope 4980as
1200-1300 Poland, Polish R Warsaw 6900a 7145eu 7270eu 9525us
1200-1300 Singapore, Radio Singapore Intl 6725as 9335as
1200-1300 Switzerland, Swiss R Intl 6165as 9805as
1200-1300 Taiwan, Radio Telepi 7130as 9610au
1200-1300 UK, BBC African Service 6190as 9149as 15510au 17705as 21640as 21960as
1200-1300 UK, BBC African Service 17805as
1200-1300 UK, BBC African Service 6195as 7225as 9580as 9740as
1200-1300 UK, BBC Asam Service 11750as 11955as

Sundays
1200 UK, BBC London (af/m/eu): Play of the Week (from 1130). See M 1130.

Mondays

Wednesdays

Thursdays

Fridays
1230 UK, BBC London (af/m/eu): The Learning Zone. See S 0155.

Saturdays
1215 UK, BBC London (af/m/eu): A Jolly Good Show. See S 0630.
### Selected Programs

**Sundays**
- 1300 Romania, R Romania Intl: Radio Newsreel. World and Romanian news.
- 1300 Switzerland, Swiss R Int: Newsreel. News Service 8:00.
- 1305 Switzerland, Swiss R Int: Newsreel. News Service 8:00.
- 1310 Romania, R Romania Intl: Panorama (Radio Tour). Holiday activities, trekking, leisure, picturesque landscape, fun, hunting, fishing, cooking tips, stamp collecting, and hobby land.
- 1315 Romania, R Romania Intl: Radio Newsreel. Travel opportunities, trekking, lesions, picturesque landscape, fun, hunting, fishing, cooking tips, stamp collecting, and hobby land.
- 1320 Romania, R Romania Intl: Romania's World Culture. Review of cultural activities of the last week.

**Mondays**
- 1300 Romania, R Romania Intl: Radio Newsreel. See S 1300.
- 1300 Switzerland, Swiss R Int: Newsreel. News Service 8:00.
- 1305 Romania, R Romania Intl: Panorama (Radio Tour). Holiday activities, trekking, leisure, picturesque landscape, fun, hunting, fishing, cooking tips, stamp collecting, and hobby land.
- 1315 Romania, R Romania Intl: Romania's World Culture. Review of cultural activities of the last week.
- 1330 Romania, R Romania Intl: Sports Roundup. Latest results in Romania matches.

**Tuesdays**
- 1300 Romania, R Romania Intl: Radio Newsreel. See S 1300.
- 1300 Romania, R Romania Intl: Newsreel. News Service 8:00.
- 1315 Romania, R Romania Intl: Inside Romania. Economic perspective of life in Romania.
- 1320 Romania, R Romania Intl: Romania's World Culture. Review of cultural activities of the last week.

**Wednesdays**
- 1300 Romania, R Romania Intl: Radio Newsreel. See S 1300.
- 1300 Romania, R Romania Intl: Newsreel. News Service 8:00.
- 1315 Romania, R Romania Intl: Inside Romania. Economic perspective of life in Romania.

**Thursdays**
- 1300 Romania, R Romania Intl: Radio Newsreel. See S 1300.
- 1300 Romania, R Romania Intl: Newsreel. News Service 8:00.
- 1315 Romania, R Romania Intl: Inside Romania. Economic perspective of life in Romania.

**Fridays**
- 1300 Romania, R Romania Intl: Radio Newsreel. See S 1300.
- 1300 Romania, R Romania Intl: Newsreel. News Service 8:00.
- 1315 Romania, R Romania Intl: Inside Romania. Economic perspective of life in Romania.
### Frequencies

| 1400-1500 | Angola, Caribbean Beacon | 11775am |
| 1400-1500 | Australia, Radio | 5900af | 6020am | 6080am | 9770am |
| 1400-1500 | Cambodia, Radio | 11660am | 12080am |
| 1400-1500 | Switzerland, Swiss 15910am | 2310do |
| 1400-1500 | Australia, VLB A salesman | 2450do |
| 1400-1500 | Vietnam, Voice of Hope | 2350am |
| 1400-1500 | Australia, VLB Tent City | 9625am |
| 1400-1500 | Canada, CBC Quebec, Quebec City | 6070am |
| 1400-1500 | Canada, CFRT Toronto | 6030am |
| 1400-1500 | Canada, CFSP Calgary | 6130do |
| 1400-1500 | China, China Radio Intl | 6160do |
| 1400-1500 | China, China Radio Int'l | 6160do |
| 1400-1500 | sm/cw/cw | 9640am | 11855am |
| 1400-1500 | Chile, Radio Int'l | 7160as | 7220os | 7405am | 9535am |
| 1400-1500 | Costa Rica, Radio Pura Vida | 9780am | 11825am |
| 1400-1500 | Czech Rep, Radio Prague | 12030am |
| 1400-1500 | Ecuador, Radio Ecuadoreño | 12610am | 15151am | 21455am |
| 1400-1500 | Ethiopia, Ethiopia Radio | 12515am |
| 1400-1500 | France, France Radio France | 5220as | 7110as | 11910as | 12300am |
| 1400-1500 | Georgia, Radio Freedom | 1545os | 15730am |
| 1400-1500 | India, All India Radio | 955as | 11620am | 13710am |
| 1400-1500 | Israel, Israel Radio | 15650as | 17533am |
| 1400-1500 | Italy, IRIS Radio | 7120as |
| 1400-1500 | Japan, JPN/NE/CW | 9500am |
| 1400-1500 | Jordan, Radio | 11690am |
| 1400-1500 | Libyan, Radio Libertas | 5470am |
| 1400-1500 | Malaysia, Radio Malaysia | 12300am |
| 1400-1500 | Nigeria, Radio Kudimak | 4850am | 7160am |
| 1400-1500 | Malaysia, RTM Kuching | 5980am |
| 1400-1500 | Mexico, Radio Mexico Int'l | 9700am |
| 1400-1500 | Netherlands, Radio | 8550am | 15585am |
| 1400-1500 | New Zealand, Radio NZ Int'l | 6150am |
| 1400-1500 | Norway, Radio Norwegian Int'l | 13800am |
| 1400-1500 | Panama, KHRN Voice of Hope | 998am |
| 1400-1500 | Portugal, Radio Portugal | 4890am |
| 1400-1500 | Philippines, Radio | 1195as |
| 1400-1500 | Russia, Voice of Russia | 473us | 490as | 497as | 592as |
| 1400-1500 | Swiss, Radio | 7114am | 771os | 723as | 724as |
| 1400-1500 | Switzerland, Swiss Radio | 7390as | 947as | 965as | 972as |
| 1400-1500 | Switzerland, Swiss Radio News | 838os | 984os | 1150os |

### Selected Programs

#### Sundays
- **1400**: Switzerland, Swiss Radio Intl: News. Five minutes of world news.
- **1400**: Switzerland, Swiss Radio Intl: The name game. A chance for you to test your knowledge of Switzerland and win prizes.
- **1400**: Switzerland, Swiss Radio Intl: Rendez-vous with Switzerland. A relaxing blend of music and interviews.

#### Mondays
- **1400**: UK, BBC London (af/am/as). East Asia Today (Eas). See S 2300.
- **1400**: Switzerland, Swiss Radio Intl: Megamix. See S 1405.

#### Tuesdays
- **1400**: UK, BBC London (af/am/as): East Asia Today (Eas). See S 2300.
- **1400**: Switzerland, Swiss Radio Intl: Rendez-vous with Switzerland. See S 1405.

#### Wednesdays
- **1400**: Switzerland, Swiss Radio Intl: Discovery. See S 1405.

#### Thursdays
- **1400**: Switzerland, Swiss Radio Intl: Discovery. See S 1405.
- **1400**: Switzerland, Swiss Radio Intl: Rendez-vous with Switzerland. See S 1405.

#### Fridays
- **1400**: UK, BBC London (af/am/as): East Asia Today (Eas). See S 2300.
1500-1600 Anguilla, Caribbean Beacon 11775am
1500-1600 Australia, Radio 59920am 00291am 06380am 95000am
1500-1600 Australia, VLBA Alice Spg 2310am
1500-1600 Australia, VLFK Katherine 2450am
1500-1600 Australia, VLF Tent Creek 2320am
1500-1600 Canada, CBC N Quebec Sv 9625am
1500-1600 Canada, CFRR Toronto 5070am
1500-1600 Canada, CTV Ottawa 6303am
1500-1600 Canada, CIXC Halifacs 6130am
1500-1600 Canada, CKZN St John's 6160am
1500-1600 Canada, CFOX Vancouver 6160am
1500-1600 Canada, w3 Radio Canada Int'l 6945am 11855am
1500-1600 China, China Radio Intl 716as 740nas 978nas
1500-1600 Costa Rica, RT Peace Intl 7380am 1505am 2154am
1500-1600 Ecuador, HJCB 1205am 15115am 2145am
1500-1600 Fiji, Fiji TV/1K 1516am
1500-1600 Georgia, Voice of Hope 1212am
1500-1600 Guam, TWK/1KWR 1510am
1500-1600 Iran, IRRS 3885am
1500-1600 Japan, R Japan/NHK World 720as 950nas 975as 11730as
1500-1600 Jordan, Radio 1169am
1500-1600 Liberia, WCNR Liberia Int'l 5100am
1500-1600 Malaysia, Radio 7263am
1500-1600 Malaysia, RTM Kota Kinabalu 5985am
1500-1600 Mexico, Radio Mexico Int'l 907as
1500-1600 Mongolia, Voice of 975as 1205as
1500-1600 Myanmar, Voice of 5990am
1500-1600 Netherlands, Radio 6890as 1558as
1500-1600 New Zealand, TVNZ 6015am
1500-1600 Nicaragua, Voice of 725as 1512as
1500-1600 North Korea, Radio Pyongyang 9641am 9975nas 11335nas 11732as
1500-1600 Poland, KHRN/Voice of Hope 9585as
1500-1600 Papua New Guinea, Radio 4990as
1500-1600 Philippines, FEBC/Manila 1195as
1500-1600 Russia, Voice of Russia WS 4730am 4940as 4975as 6175as
1500-1600 Russia, Voice of Russia WS 715as 7210as 7275as 9470as
1500-1600 Russia, Voice of Russia WS 905as 9685as 969as
1500-1600 Russia, Voice of Russia WS 6035as
1500-1600 South Africa, Channel Africa 9440as

**FREQUENCIES**

**Selected Programs**

**Sundays**

- UK, BBC London (am/as): Either Soundsbyte (virtual games and the internet) or Seeing Stars (a look at the night skies).
- UK, BBC London (as): Play of the Week (EAs). A different radio drama program each week (alternative programming for South Asia).
- UK, BBC London (am/as): The Learning Zone. For learners English. See S 1605.
- UK, BBC London (as): Take Five (EAs). See T 0455.

**Wednesdays**

- UK, BBC London (am/as): Focus on Africa. See S 1705.
- UK, BBC London (as): From Our Own Correspondent. See S 0330.
- UK, BBC London (as): The Learning Zone. See S 1515.
- UK, BBC London (as): Everywoman. See M 1000.
- UK, BBC London (as): Meridian On Screen. See M 1600.
- UK, BBC London (as): The Learning Zone. See S 1515.

**Thursdays**

- UK, BBC London (am/as): Focus on Africa. See S 1705.
- UK, BBC London (as): The Vintage Chart Show. See M 0730.
- UK, BBC London (as): Composer of the Month. See M 1630.
- UK, BBC London (as): Take Five (EAs). See T 0455.

**Fridays**

16:00 UTC

**SHORTWAVE GUIDE**

**12:00 AM EST**

**9:00 AM PDT**

### Frequencies

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<th>Country/Location</th>
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### Selected Programs

**Sundays**

- **1600** Switzerland, Swiss R Intl: News. See S 0400.
- **1600** Switzerland, Swiss R Intl: News. See S 0415.

**Mondays**

- **1600** Switzerland, Swiss R Intl: News. See S 0400.
- **1600** UK, BBC London (ama/eu): Europe Today. See M 0300.
- **1600** Switzerland, Swiss R Intl: News. See S 0415.
- **1600** UK, BBC London (ama/eu): Insight. An examination of a topical aspect of the international scene.

**Tuesdays**

- **1600** Switzerland, Swiss R Intl: News. See S 0400.
- **1600** UK, BBC London (ama/eu): Europe Today. See M 0300.
- **1600** Switzerland, Swiss R Intl: News. See S 0415.

**Wednesday**

- **1600** Switzerland, Swiss R Intl: News. See S 0400.
- **1600** UK, BBC London (ama/eu): Europe Today. See M 0300.
- **1600** Switzerland, Swiss R Intl: News. See S 0415.
- **1600** UK, BBC London (ama/eu): Insight. See M 1645.

**Thursdays**

- **1600** Switzerland, Swiss R Intl: News. See S 0400.
- **1600** UK, BBC London (ama/eu): Europe Today. See M 0300.
- **1600** Switzerland, Swiss R Intl: News. See S 0415.
- **1600** UK, BBC London (ama/eu): Insight. See M 1645.

**Fridays**

- **1600** Switzerland, Swiss R Intl: News. See S 0400.
- **1600** UK, BBC London (ama/eu): Europe Today. See M 0300.
### FREQUENCIES

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**1900-2000**

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### 2200 UTC

<table>
<thead>
<tr>
<th>FREQUENCIES</th>
<th>2200-2230</th>
<th>Albania, R Irena Inti</th>
<th>6025am</th>
<th>7135am</th>
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<tbody>
<tr>
<td>2200-2230</td>
<td>2200-2230</td>
<td>Angola, Caribbean Beacon</td>
<td>6905am</td>
<td>9965am</td>
</tr>
<tr>
<td>2200-2230</td>
<td>2200-2230</td>
<td>Armenia, Voice of</td>
<td>4810am</td>
<td>9965am</td>
</tr>
<tr>
<td>2200-2230</td>
<td>2200-2230</td>
<td>Australia, Radio</td>
<td>9660am</td>
<td>13175am</td>
</tr>
<tr>
<td>2200-2230</td>
<td>2200-2230</td>
<td>Australia, Radio</td>
<td>9660am</td>
<td>13175am</td>
</tr>
<tr>
<td>2200-2230</td>
<td>2200-2230</td>
<td>Austria, Radio</td>
<td>2130</td>
<td>2145</td>
</tr>
<tr>
<td>2200-2230</td>
<td>2200-2230</td>
<td>Austria, Radio</td>
<td>2130</td>
<td>2145</td>
</tr>
<tr>
<td>2200-2230</td>
<td>2200-2230</td>
<td>Austria, Radio</td>
<td>2130</td>
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<td>2200-2230</td>
<td>Austria, Radio</td>
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<td>Austria, Radio</td>
<td>2130</td>
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<tr>
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<td>2200-2230</td>
<td>Austria, Radio</td>
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<td>2200-2230</td>
<td>Austria, Radio</td>
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<tr>
<td>2200-2230</td>
<td>2200-2230</td>
<td>Austria, Radio</td>
<td>2130</td>
<td>2145</td>
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<tr>
<td>2200-2230</td>
<td>2200-2230</td>
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### 2300 UTC

<table>
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<tr>
<th>FREQUENCIES</th>
<th>2300-2330</th>
<th>Austria, Radio</th>
<th>9660am</th>
<th>13175am</th>
<th>15175am</th>
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</thead>
<tbody>
<tr>
<td>2300-2330</td>
<td>2300-2330</td>
<td>Austria, Radio</td>
<td>9660am</td>
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<td>15175am</td>
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<tr>
<td>2300-2330</td>
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<td>13175am</td>
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<td>17795am</td>
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<tr>
<td>2300-2330</td>
<td>2300-2330</td>
<td>Austria, Radio</td>
<td>9660am</td>
<td>13175am</td>
<td>15175am</td>
<td>17795am</td>
</tr>
<tr>
<td>2300-2330</td>
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<td>Austria, Radio</td>
<td>9660am</td>
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<td>15175am</td>
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</tr>
<tr>
<td>2300-2330</td>
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<td>Austria, Radio</td>
<td>9660am</td>
<td>13175am</td>
<td>15175am</td>
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<tr>
<td>2300-2330</td>
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<td>Austria, Radio</td>
<td>9660am</td>
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<tr>
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<td>9660am</td>
<td>13175am</td>
<td>15175am</td>
<td>17795am</td>
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</tbody>
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FREQUENCIES

- **2100-2200**: China, China Radio Inti
- **2200-2300**: China, China Radio Inti
- **2300-2400**: China, China Radio Inti

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Updated: May 1998

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www.americanradiohistory.com

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**MONITORING TIMES**

- **2200 UTC**: Albania, R Irena Inti
- **2200 UTC**: Angola, Caribbean Beacon
- **2200 UTC**: Armenia, Voice of
- **2200 UTC**: Austria, Radio
- **2200 UTC**: China, China Radio Inti
- **2200 UTC**: China, China Radio Inti
- **2200 UTC**: China, China Radio Inti
### Frequencies

<table>
<thead>
<tr>
<th>Time</th>
<th>Country/Program</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>2300-0000</td>
<td>Anguilla, Caribbean Beacon</td>
<td>6305am</td>
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<tr>
<td>2300-0000</td>
<td>Australia, Radio</td>
<td>9690pa</td>
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<tr>
<td>2300-0000</td>
<td>Australia, VLBK Katherine</td>
<td>5025do</td>
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<tr>
<td>2300-0000</td>
<td>Austria, VLB Hanzlic</td>
<td>4910do</td>
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<tr>
<td>2300-0000</td>
<td>Bulgaria, Radio</td>
<td>9485am</td>
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<tr>
<td>2300-0000</td>
<td>Canada, CBC Quebec</td>
<td>9265am</td>
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<tr>
<td>2300-0000</td>
<td>Canada, CRFA Toronto</td>
<td>6070am</td>
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<td>2300-0000</td>
<td>Canada, QVOP Ontario</td>
<td>6030am</td>
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<tr>
<td>2300-0000</td>
<td>Canada, CHPX Halifax</td>
<td>6130am</td>
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<tr>
<td>2300-0000</td>
<td>Canada, CKZJ St. John's</td>
<td>6160am</td>
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<td>2300-0000</td>
<td>Canada, CKUZ Vancouver</td>
<td>6160am</td>
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<td>2300-0000</td>
<td>Canada, R Canada Intl</td>
<td>596am</td>
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<td>2300-0000</td>
<td>Costa Rica, Rev World R</td>
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<td>2300-0000</td>
<td>Costa Rica, PLC Peace Intl</td>
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<td>2300-0000</td>
<td>Cuba, Radio Havana</td>
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<td>2300-0000</td>
<td>Egypt, Radio Cairo</td>
<td>9900pa</td>
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<td>2300-0000</td>
<td>Germany, Deutsche Welle</td>
<td>5975am 9090am 7235am 9690am</td>
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<tr>
<td>2300-0000</td>
<td>Guam, AWK-KSIV</td>
<td>11775as 2300-0000</td>
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<tr>
<td>2300-0000</td>
<td>India, All India Radio</td>
<td>7410as 9705as 995as 11620as</td>
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<td>2300-0000</td>
<td>Liberia, LIB/Liberia Intl</td>
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<td>2300-0000</td>
<td>Malaysia, Radio</td>
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<td>Moldova, R Moldova Intl</td>
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<td>2300-0000</td>
<td>New Zealand, R NZ Intl</td>
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<td>Nigeria, PRCN Radio</td>
<td>1340pa 4770do 49900pa</td>
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<td>2300-2315</td>
<td>North Korea, R Pyongyang</td>
<td>11335am 11700am 13760am 15130am</td>
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<td>2300-0000</td>
<td>Papua New Guinea, NBC</td>
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<td>2300-0000</td>
<td>Romania, R Romania Intl</td>
<td>5955eu 7196eu 9570am 11820am</td>
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<td>2300-0000</td>
<td>Singapore, SBC Radio One</td>
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<td>Singapore, R Singapore Intl</td>
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<td>2300-0000</td>
<td>Solomon Islands, SIBC</td>
<td>5022pa</td>
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### Selected Programs

**Sundays**

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<thead>
<tr>
<th>Time</th>
<th>Country/Program</th>
<th>Frequency</th>
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</thead>
<tbody>
<tr>
<td>2300</td>
<td>UK, BBC London (am)</td>
<td>World News</td>
</tr>
<tr>
<td>2300</td>
<td>UK, BBC London (as)</td>
<td>East Asia Today</td>
</tr>
<tr>
<td>2300</td>
<td>UK, BBC London (am)</td>
<td>Outlook</td>
</tr>
<tr>
<td>2300</td>
<td>UK, BBC London (as)</td>
<td>Insight</td>
</tr>
<tr>
<td>2300</td>
<td>UK, BBC Radio One (am)</td>
<td>Seven Days</td>
</tr>
</tbody>
</table>

**Mondays**

<table>
<thead>
<tr>
<th>Time</th>
<th>Country/Program</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>UK, BBC London (as)</td>
<td>East Asia Today</td>
</tr>
<tr>
<td>2000</td>
<td>UK, BBC London (am)</td>
<td>Outlook</td>
</tr>
<tr>
<td>2000</td>
<td>UK, BBC London (as)</td>
<td>Insight</td>
</tr>
<tr>
<td>2000</td>
<td>UK, BBC London (as)</td>
<td>Health Matters</td>
</tr>
</tbody>
</table>

**HAUSER'S HIGHLIGHTS**

**SWEDEN: R. SWEDEN**

*Z-98* in English on SW to N. America

- **kHz**
  - 15240, 17870
  - 15240, 9735
  - 15240, 11665
  - 13400, 17370
  - 13400, 01158

**HAUSER'S HIGHLIGHTS**

**ICELAND: ICELAND RADIO**

*Z98* assignments for, 10 kHz are:

- **kHz**
  - 1845-1930
  - 1845-2015
  - 1200-1300
  - 1400-1445
  - 2300-2435
  - 1200-1300
  - 1200-1300

That's official, but this station has a track record of not adhering to it (gh)

**HAUSER'S HIGHLIGHTS**

**JAPAN: NHK**

*Z-98* relays via Canada

- **kHz**
  - 9050
  - 9100
  - 11705

Direct from Yamata to NAM:

- 0300-0400
  - 0500-0700
  - 1400-1500
  - 1700-1800
  - 2100-2200

(NHK via Kunitoshi Hishikawa via Karl Leite, radioescr)
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May 1998 MONITORING TIMES 59
In the article “The Ultimate Longwave Receiving Setup” (MT Dec ’97), alluded to a mode of propagation that is not well known today: carrier current. This mode of transmitting an RF signal is many decades old but has been rumored to be making a comeback in North America for certain activities.

The theory is quite elementary: you simply induce a low power RF signal on an existing metallic distribution grid. For example, you induce, or couple, the low power RF AM signal from a small transmitter onto the electrical distribution system of a building, or buildings, for the purpose of broadcasting only to listeners within that discrete electrical network.

The most common use for this system today is for the distribution of a university radio program inside the perimeter of the university compound. No license is required for such an installation and the costs involved are minimal: the electrical distribution system is already in place. Most of the costs are to install RF bypass networks to avoid the impedance mismatch created by transformers and other types of coils and chokes when going from building to building.

In the effort to reach every corner of campus, very often the neighborhood is unintentionally within the broadcast area. In most cases, these low power stations will choose a split channel (for example 675 kHz) in an area of the AM band where there is very little local activity to avoid undue interference.

In order to receive the broadcast it is only necessary to plug your AC operated receiver into the electrical distribution network of the university, or if you use a battery powered receiver, you have to be located within the confines of the campus.

When North America was crisscrossed by numerous landline telegraph systems (before the advent of microwave), one pair of wires was made to carry more than one message by multiplexing the messages on the same line. One method was used to carry a large number of low power radio frequencies on the same pair. If you used one set of frequencies from point "A" to point "B," it was possible to use a different set of frequencies for "B" to "A" and have a full duplex circuit.

Some of the largest users of carrier current in the LF part of the radio spectrum were (and in some places still are) the power production and distribution companies. Let’s face it, you already have a large metallic network covering your territory; why not use it for your internal telephone system and also for telemetry between load control centers and production units? (A person tapping such a phone line today, however, had better know what he is doing; some power lines now carry 1.3 MV. Yes, that’s 1,300,000 volts!)

One problem arises in the fact that 60 Hz interference and the various induced harmonics at 120, 180 Hz, etc. do not give a quiet, quality transmission. However, the circuits are good enough for controlling purposes using radio frequencies in the 180 kHz range.

New Zealand power utilities are still using this system and it plays havoc with the LF experimenters and aficionados in that part of the world. In North America, I have heard that carrier current is coming back to life in the hydro network, but I have not been able to confirm.

UNFAVORABLE CONDITIONS: Search around the last listed frequency for activity.
PROGRAMMING SPOTLIGHT

John Figliozi
jfiglio1@nycap.rr.com

Eavesdropping on Africa; Part Two: “Into Africa”

Last month, we profiled the programming of the two African broadcasters with adequate power to project beyond continental borders. This month we look at five prominent broadcasters outside Africa with programming specifically geared to the continent. Everyone has their own interests in the area, and listeners would be wise to critically compare both external and internal broadcasters in order to assess the issues and events shaping the region.

Britain’s historical relationship with Africa is centered in two regions: western and southern Africa. The most comprehensive range of programming to and about Africa on the international airwaves comes from the BBC, which devotes one of its three programming streams to Africa from 0200 to 2245 daily.

Here’s a comprehensive schedule, in time order, of regular BBC programs:

<table>
<thead>
<tr>
<th>Time</th>
<th>Program</th>
</tr>
</thead>
<tbody>
<tr>
<td>0330</td>
<td>Sun. African Quiz (monthly current events test)[1st Sun.]</td>
</tr>
<tr>
<td>0330</td>
<td>Sun. Postmark Africa (expert answers to any question)[exc. 1st Sun.]</td>
</tr>
<tr>
<td>0330</td>
<td>M-F Network Africa (breakfast show w/news, sports, personalities, music)</td>
</tr>
<tr>
<td>0430</td>
<td>Sun. The Art House (the arts in Africa)</td>
</tr>
<tr>
<td>0430</td>
<td>M-F Network Africa (breakfast show w/news, sport, personalities, music)</td>
</tr>
<tr>
<td>0431</td>
<td>Sat. African Quiz (monthly current events test)[1st Sat.]</td>
</tr>
<tr>
<td>0431</td>
<td>Sat. The Week in Africa (regional events review)[exc. 1st Sat.]</td>
</tr>
<tr>
<td>0530</td>
<td>Sun. Postmark Africa (expert answers to any question)</td>
</tr>
<tr>
<td>0530</td>
<td>M-F Network Africa (breakfast show w/news, sport, personalities, music)</td>
</tr>
<tr>
<td>0531</td>
<td>Sat. Talkabout Africa (discussion of African events and issues)</td>
</tr>
<tr>
<td>0530</td>
<td>Sun. African Perspective (opinion, comment and discussion)</td>
</tr>
<tr>
<td>0630</td>
<td>M-F Network Africa (breakfast show w/news, sport, personalities, music)</td>
</tr>
<tr>
<td>0631</td>
<td>Sat. African Quiz (monthly current events test)[1st Sat.]</td>
</tr>
<tr>
<td>0631</td>
<td>Sat. The Week in Africa (regional events review)[exc. 1st Sat.]</td>
</tr>
<tr>
<td>0730</td>
<td>Sat. The Art House (the arts in Africa)</td>
</tr>
<tr>
<td>1505</td>
<td>M-F Focus on Africa (correspondents’ reports from around the continent)</td>
</tr>
<tr>
<td>1615</td>
<td>Mon. Fast Track (weekly review of African sport)</td>
</tr>
<tr>
<td>1615</td>
<td>Tue. Money Focus (African business magazine)</td>
</tr>
<tr>
<td>1615</td>
<td>Wed. Talkabout Africa (discussion of African events and issues)</td>
</tr>
<tr>
<td>1705</td>
<td>Thu. Jive Zone (contemporary African music)</td>
</tr>
<tr>
<td>1930</td>
<td>Fri. African Perspective (opinion, comment and discussion)</td>
</tr>
<tr>
<td>1930</td>
<td>Focus on Africa (correspondents’ reports from around the continent)</td>
</tr>
<tr>
<td>1940</td>
<td>Daily African News</td>
</tr>
<tr>
<td>1930</td>
<td>M-F Focus on Africa (correspondents’ reports from around the continent)</td>
</tr>
<tr>
<td>1901</td>
<td>Sun. Postmark Africa (expert answers to any question)</td>
</tr>
<tr>
<td>1901</td>
<td>Mon. Fast Track (weekly review of African sport)</td>
</tr>
<tr>
<td>1901</td>
<td>Tue. Money Focus (African business magazine)</td>
</tr>
<tr>
<td>1901</td>
<td>Wed. Talkabout Africa (discussion of African events and issues)</td>
</tr>
</tbody>
</table>

1901 Fri. African Perspective (opinion, comment and discussion)
1900 Fri. African World Tonight (African news, sports and weather)
1730 Sat. Voices of Africa (interviews w/prominent Africans)
1730 Sat. Music Time in Africa (traditional and modern African music)[part 1]
1730 Sun. Voices of Africa (interviews w/prominent Africans)
1730 Sun. Music Time in Africa (traditional and modern African music)[part 2]
1900 M-F African World Tonight (African news, sports and weather)
1910 Sat. Voices of Africa (interviews w/prominent Africans)
1930 Sun. Music Time in Africa (traditional and modern African music)
1934 M-F World of Music (popular music w/African roots)
2000 M-F African World Tonight (African news, sport and weather)
2000 S/S Nightline Africa (reports on news and world events)

The importance that Germany places on Africa is demonstrated by Deutsche Welle’s seven daily transmissions to the continent in English alone. News bulletins specially prepared for the African service are broadcast at 0400, 0600, 0900, 1100, 1600, 1900 and 2100. DW also offers three Africa-specific programs: Good Morning Africa features music, gossip and letters to DW and airs Tuesday through Friday at 0430; African Kaleidoscope examines recent issues and events in Africa at 0915, 1115 and 2115 on Saturdays; and the daily (Monday through Friday) Africa Report provides reports and background on African news, heard at 1130, 1630 and 1930.

The French continue to exert considerable influence in north, east and central Africa roughly north of the equator, where it was the primary colonial power. Many diverse nationalities and exile groups from African countries also reside in France. These factors, along with a healthy French suspicion of others’ motives on the continent, regularly bring France—willingly and unwillingly—into an active role in many African issues and conflicts.

RFT’s 1600 transmission pays special attention to Africa with a daily half-hour newscast designed to present a complete panorama of African news, issues, sport and current affairs. East Africa gets its own special focus between 1700 and 1730. There are also a few short-form feature programs with an emphasis on Africa. These include: Echoes from Africa, on daily life in Africa, broadcast during the 1654 to 1730 block on Mondays, the 1230 to 1257 features block on Tuesdays and the 1630 to 1654 block on Thursdays; Drumbeat, a report on African culture and lifestyles, is broadcast during the 1630 to 1654 block on Tuesdays and the 1654 to 1730 block on Wednesdays; Jumbo, a weekly report on East Africa, is broadcast during the 1654 to 1730 block on Tuesdays. Spotlight on Africa, examining recent African events and issues, is broadcast Saturdays in the 1230 to 1257 feature block and 1630 to 1654 feature block, and on Sundays in the 1654 to 1730 block.

The Netherlands’ ties to Africa stem from the Dutch East India Company’s settlement of southern Africa, where Capetown was developed during the seventeenth and eighteenth centuries as an important port in the spice trade. Their descendants came to regard themselves more as Africans than Europeans. They are responsible for the development of a strong agricultural economy and the Afrikaans language, but also bear some of the responsibility for the creation and enforcement of apartheid policies only recently repudiated.

Radio Netherlands does not produce any special feature programs for Africa. However, its news bulletins and Newsline analysis program to Africa in the 1730, 1830 and 1930 transmissions are specially prepared daily with items of interest primarily for African audiences.

Of course, we have limited ourselves to a review of programs in the English language. An individual conversant in French, for example, would have another range of perspectives available. We can all appreciate the wonderful African music presented by Afrique Numero Un (Africa Number 1) between 0500 and 2300 on either 17675, 15475 or 9580 kHz.

Enjoy and learn about the African continent—available only on shortwave!

(Notes and days in UTC. Frequencies for the programs listed can be had by referring to the ‘Shortwave Guide’ section of this magazine’s ‘Shortwave Guide’ section of this magazine.)
When it comes to aviation, some of the most fun a beginner can experience is to be found at air shows. For that matter, you don’t even have to go to an air show to listen in. But, since this is May and we’re thinking about getting out of the shack and into the sunlight, we’ll talk about monitoring from the flight line.

Air shows have grown in popularity over the last decade or so. Further, since command and control of just about everything from the aircraft to the water fountains is subject to radio communication, monitoring air show activities has also grown. Both the popularity of air shows and the popularity of monitoring them will have an effect on how you carry yourself through the air show experience.

Let’s start with the basics: Where do you find air shows? Most air shows are held on military reservations or at small and medium-sized commercial airports. The big commercial air hubs are usually not involved because interrupting the flight line for a day or two is simply not an option.

Start by making a few calls to the airports listed in your local phone book. You can also call the public information desk at nearby military air bases. If you’re on the Internet, just point your browser’s search engine toward the words “air shows” and you’ll come up with plenty of places to go throughout the country. As you read this article you are right in the midst of the prime air show season, so get cracking.

Maximize your monitoring

Okay, you’ve discovered that nearby Wrongway Peachfuzz Air Force Base is holding a show in a few weeks. How do you go about getting ready to monitor activities at the show?

First you need to check out your receiver situation. It is a cruel world, and not all scanners are created equal. First you must determine if your scanner can receive aircraft frequencies and the all important AM mode. Air communication is commonly done in AM because this mode does not have the “capture effect” of FM.

Capture effect is when a strong signal dominates a receiver, eliminating any weaker signals. This is great for a car radio but not good when you’re in the air hoping your emergency or distress communications are being heard by the tower.

The important frequency ranges for air show aircraft monitoring include 108–137 MHz, the commercial aircraft band and 200–400 MHz, the military aircraft band. Also useful is the 406–420 MHz federal government frequency band, as this is often in use by military ground support operations at air shows.

Within the standard air band one frequency will need to go into a priority position. 123.40 MHz is recognized as the common air show frequency just about everywhere. Another frequency you will want to track down is that of the “Air Boss.” This is the person who is running the whole show. If there are last-minute changes this will be where you’ll hear about them first.

For example, I was at a show recently where the chatter on the Air Boss frequency told me that there was going to be a previously unscheduled “fly by” of a Korean War era MIG fighter. I not only knew the plane was coming in, but when and from what direction, well ahead of anyone not equipped with a scanner. The Air Boss frequency is usually a regularly assigned airport operation frequency which is set aside for that particular day, but check around to be sure.

Other frequencies you will want to know before you get to the show are the regular tower, ground control, approach control, departure control and air-to-air frequencies used at the airport or air base.

The big performers such as the Blue Angels, the Thunderbirds, or the Golden Knights all have a group of frequencies they use for doing their show. I’ve included the most recent information I was able to locate. These frequencies do change from time to time, as you can see by comparing this list with this month’s cover feature. Also check the military land mobile frequencies between 137 – 144 MHz as these teams often use them for ground and maintenance operations.

More than just air

But wait a minute. There are a lot of other neat frequencies to consider besides the ones directly related to the guys (and gals) in the sky. The bigger air shows have been known to attract enough attendees to populate a small city. Tens of thousands of people need a certain amount of support and management. Consequently, many of the local public safety, fire and emergency management assets will also be on hand for the show.

My local ARES/RACES amateur radio group gives support communications to two local air shows each year, so even the ham frequencies in the 2 meter (144-148 MHz) and 70 centimeter (420-450 MHz) bands have high monitoring potential during many air shows. Then there are the various commercial operations to consider, such as the food vendors and such.

Don’t roll your eyes and rule out the business band frequencies just yet. Many air show performers are in fact small business people and as such they maintain some level of operations on traditional business frequencies.

In my experience it is worth the trouble to keep an ear on the business bands as yet another source of air show monitoring fun.

If you are able to get your hands on a second scanner, a good strategy is to load one up with the stuff pertinent to the flight line and the other with the public safety and business stuff. That way you can keep an ear on the airplanes while still figuring out what is happening at ground level.
**Digging for frequencies**

Okay, so where do you unearth these frequencies? If the air show in question has been held for more than a year or two, head first for the internet. A quick search on the air show name coupled with the word “frequencies” is bound to turn up a list of someone else’s prior successes. Don’t forget to cruise some of the other columns in *MT* before any trip to an air show, especially Jean Baker’s *Plane Talk*.

Other resources include books such as Bob Evan’s *The Worldwide Aeronautical Communications Frequency Directory*, Tom Kneitel’s *AirScan* or Robert A. Coburn’s *Aeronautical Frequency Directory* (Grove carries most of these).

Personally, I also like to go to the original sources. I use the United States Government *Flight Information Publications, Airport/facility Directory* for my area. These are updated every eight weeks and can be purchased most anywhere that provides service to private pilots, such as local airports or chart and map stores. Not only will you get a look at important local frequencies with this publication, but you will also get a great deal of information about the airport itself. Unfortunately, this publication does not cover military air fields, but it still is useful for air shows and air monitoring that occurs beyond the government installations. Some larger libraries may also carry the local area books.

Remember, digging around for frequencies is half the fun of the radio hobby. And don’t forget, if you come up with something new, please share it with the rest of us.

Okay now, you’ve got a scanner or two and you’ve loaded them up with frequencies. You’re about to head out to the air show. What else is there?

**Smart moves**

Well, you may be ready to monitor all those neat signals in the air and on the ground, but if you don’t put a little more thought into your preparations you may not enjoy your listening experience to the fullest.

Get prepared for a long day. Most air shows run from early in the morning until near sunset. Last year’s NAS Oceana, Virginia, Air Show even had an evening presentation. Now tack on to the actual show times an hour or so of traffic and parking delays to get in and out of the show area and you’re looking at a full day.

The first obvious point is to have enough battery power for your scanners. Given the current drain of most common scanners, it wouldn’t hurt to pack a second set of cells for each receiver. Maybe even some standard alkalines as backup if your rigs allow for it. A “fanny” pack or a small back pack should carry all your radio needs. If you’re also carrying a camera, you will want to remember plenty of extra film because you will pay premium prices if you buy supplies from the vendors along the flight line.

While you’re considering the energy needs of the scanners, don’t forget the energy needs of the scannist as well. Pack along food or plan to buy it on scene. Most air shows have restrictions against coolers but you should be able to park in a canteen or water bottle because it may be a long walk between water fountains.

If you’ve never been to a military base before, you will discover that the flight line is usually made up of a lot of nice shiny white concrete, which does a great job of magnifying the hot sun. Dress appropriately and plan to go through a tube or two of sunscreen. A brimmed hat and sunglasses are also important under such conditions.

So now you’re all set; head out to the flight line and listen in on some of the best signals that scanning has to offer. Have fun. Keep em’ flyin’!

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**Equipment savvy**

As for antennas, you’re going to find yourself in the midst of an RF rich environment. The standard rubber duckies that come with any handheld scanner should do just fine. You may even experience overloading in close proximity to the transmitting equipment. In such cases, do the old poor man’s attenuator trick: Just disconnect the duckie and listen in without an antenna attached. You’ll be surprised at how well this will work. NASCAR fans have used this trick at race tracks for years.

A set of headphones is nearly essential to scanning at an air show. They cut down on the noise, allowing you to hear the conversations more clearly. If you take up my suggestion of using two scanners, it’s easy enough to rewire a set of stereo headphone to allow you to monitor one scanner with each ear. I’ve used this technique at several air shows and other events with great success.
Q. Are the elements in the popular Grove Scanner Beam strong enough to be mounted horizontally rather than vertically as specified? (M. Mewes, Oakville, Ont.)

A. Certainly. The Scanner Beam is custom-made for Grove under contract with Antenna Craft, a leading manufacturer of TV antennas, using conventional TV antenna hardware and elements, and those are made to withstand self-supported, horizontal mounting.

Q. Why does an AC motor stay at the same speed, yet draw more current, when it is under load? (Mark Burns, Terre Haute, IN)

A. An AC motor is a transformer with a short-circuited secondary winding (armature) which spins because of the electromagnetic attraction/repulsion effects of the 60 Hz alternating current. The spinning of the armature winding in the electromagnetic field of the primary (field) winding generates "counter EMF," a voltage which opposes the primary current.

When the armature is spinning freely (no load), synchronized with the 60 Hz field, the relative position of the armature at any instant in time produces maximum counter EMF, so very little current flows. But when a load is placed on the motor, causing the armature to slip (slow down), it is no longer synchronized, so it develops less counter-EMF. This means that more current flows, increasing the strength of the magnetic field, forcing the armature back toward its synchronized position.

Q. What equipment do I need to monitor 900 MHz digital telephones? (Johnny K., Hinton, WV)

A. You would need a matching digital telephone. 900 MHz digital phones are unmonitorable by any consumer receiving equipment. Their signals are digital (broken into tiny, encoded, computerized "bits") and the spread-spectrum signal is transmitted over several megahertz of spectrum. Even if you had the equipment to hear it, monitoring cellular and cordless telephone calls is unlawful.

Q. Although it is unlawful for anyone in the U.S. to purchase domestically, or even import, cellular-capable scanners, can someone in Canada or any other country order such a product from a U.S. company like Grove Enterprises? (Wm. Mewes, Oakville, Ont.)

A. Absolutely. Grove Enterprises sells full-coverage scanning receivers to non-U.S. recipients, U.S. government agencies, and cellular service providers as allowable by law.

Bob’s Tip of the Month

Digital Frequency Displays for Analog Radios

Many older radios, and most modern, inexpensive ones, have analog (slide rule) dials with dismal frequency accuracy. At one time several entrepreneurial manufacturers offered retrofitted digital displays to upgrade analog radios. But with the advent of digital displays in most medium- and high-end radios, these sources of add-on displays have become virtually extinct.

Reader Frank Shoemaker alerted us to the availability of a digital frequency display that can be added to many of these radios, including the popular GE Superadio and even multiband receivers, to provide much better frequency readout accuracy. Keep in mind, however, that the addition of such a device requires surgery and should not be attempted by anyone inexperienced in electronics and soldering.

The device is available in two forms: a parts kit which includes all components and a circuit board for $49.95, and a factory wired unit in a cabinet, ready to attach to the receiver’s oscillator stage, for $169 plus $6 shipping. For more information contact the builder: Ron Hankins, KK4PK, 555 Seminole Woods Blvd., Geneva, FL 32732; ph. (407) 349-9150.

We know nothing about this individual or his product, so readers are advised to visit his Web site (www.aade.com) or call or write him for more information—and to recommend that he advertise his products in MT!
Q. Can I use the AC wiring through my apartment house as a longwire receiving antenna for shortwave listening? (Peter John Das, Reseda, CA)

A. You sure can, but with some precautions. First, you don’t want to be electrocuted (bad), cause an electrical fire (also bad), or burn out your equipment (even worse!), so the 120 volts must never come into contact with the equipment.

The simplest way to isolate the signal from the line voltage is by connecting a capacitor between the wall plug and your receiver’s antenna connector. Visit Radio Shack and get one rated at least 600 volts, with a capacitance of approximately 0.005 microfarad (μF). Actually, anything from 0.001 to 0.01 will work just fine, but the voltage requirement is important to prevent failure.

The “hot” (AC line) connection must be enclosed; a convenient replacement appliance plug from Wal-Mart, your friendly hardware store, or snipped off an old appliance, is ideal for this. Any visible AC wiring must be covered by a layer of PVC electrical tape.

The upside of the AC line antenna is that it’s already there and probably intercepts plenty of signal voltage; the downside is that everyone’s electrical and electronic appliances (including fluorescent lights, heat-thermostats, and SCR dimmer controls—yuk!) are connected to it, and the electrical noise may be staggering. But you will never know unless you try.

Make-do antennas have always been popular among cliff dwellers. Many shortwave listeners (SWLs) have employed telephone wiring (also use the aforementioned capacitor, but you can get by with a 200 volt rating), bedsprings, flagpoles, rain gutters and downspouts, fire escapes, porch railings, and other metal extensions and contrivances.

Q. How well do the new “atomic clocks,” available from companies like Zeitz, work? (Jose Fernandez)

A. So far as we can tell, quite well. We have been trying unsuccessfully to get an evaluation sample of their new line to review for our readers. The clocks contain a tiny VLF receiver which picks up the time signals from WWVB, Ft. Collins, Colorado, on 60 kHz. Now that the power of WWVB has been increased, the usable area for such automatic-resetting clocks has increased over most of North and Central America.

Q. If I moved my Kiwi loop antenna from the basement to an upstairs location, will my signals improve? (Phil Davis, Troy, IL)

A. You betcha—assuming, of course, that the new location isn’t near a source of electrical interference that wasn’t present at the lower location. Move around, experiment with different locations for best performance.
Hams on Longwave?

From time to time we've discussed the possibility of a licensed LF ham band in North America. Until recently, conventional thinking held that such a band would automatically be placed in the Part 15 (license-free) "Lowfer" (low frequency experimenters) band at 160 to 190 kHz. This has begun to change, however. The factors driving this are many, but perhaps the most significant is the fact that several European countries have approved bands well outside this range. This has strong implications for the hope of transcontinental distance reception (DX).

This month, John H. Davis of the Longwave Club of America shares his views on the subject. I urge readers to consider the issue seriously, and send their comments to the Federal Communications Commission (FCC) and the American Radio Relay League (ARRL) Section Manager for their area. (Refer to QST magazine or the League's web site at: http://www.arrl.org/)

A GUEST EDITORIAL
BY JOHN H. DAVIS (GA)

For most of this century, the name "amateur radio" was nearly synonymous with "shortwave" (HF). Recently, the two meter band and higher frequencies have been identified with ham radio. But longwave? Not since the very earliest years of this century, when ever-increasing pressure for commercial spectrum moved amateurs first to medium-wave, then to HF.

Until now.

Half a dozen European nations have adopted the Council of European Postal and Telecommunications (CEPT) administrations' recommendation for a narrow ham band at 160 kHz before you read this. New Zealand, Australia, and Papua New Guinea already have amateur activity in the 160-190 kHz range. And our own ARRL may again be routing itself to action.

What shape might an LF ham band take in North America, and what about the impact on existing experimental activity? As the Longwave Club of America's Part 15 beacon editor, I'm deeply concerned about that question.

Many Lowfer enthusiasts have engaged in lively online discussion this past winter. One of the key questions is: why change anything? Some view a ham band as encroachment of new limitations and requirements into a relaxed environment. Others don't want to see high power commercial rigs and idle rag-chewers take over, as on some ham bands. Ironically, these concerns are voiced less by the non-ham inhabitants of 1750 MHz than by holders of licenses most likely to qualify for the new band.

Clearly, there is something unique about the challenge of a one-watt transmitter and a 15-meter antenna at LF. Amid the QRM and QO (radio noise), nature awards DX grudgingly. It's a true test of skill to transmit or receive beyond a few miles, so multi-hundred mile contacts (QSOs) are a rare treat indeed. These challenges have prompted inexpensive implementation of advanced modulation methods, such as coherent Morse code (CW) and binary phase shift keying (BPSK).

But at some point, advancement of the radio art requires more signal-to-noise ratio. Some suggest raising Part 15 power or antenna limits, but the FCC places low priority on proposals that benefit so few people. Furthermore, Part 15 has no allocation status whatsoever, and will never receive the same consideration as a licensed service. In that sense, the freedom of license-free operation is also its biggest drawback.

Among amateur radio's objectives are development of circuitry and operating techniques for all kinds of radio propagation. It will not be hard to demonstrate that an LF ham band is consistent with this end. Thus, if international activity piques enough interest domestically, there will eventually be an LF ham band. The best approach, probably, is to be in the forefront, helping shape the final outcome.

One assumption about an LF ham band needs to be questioned at the outset—that it will automatically be at 160-190 kHz. About two years ago, the National Telecommunications and Information Administration (NTIA) mentioned this band in a proposal for additional amateur spectrum, and much discussion has gravitated toward it.

There's nothing magic about this choice. It's little used by critical services, so less engineering work would be needed than for other slots. And it's the widest chunk of spectrum one is likely to find at LF.

However, it's not necessarily the best place for a ham band. It might not be available in Alaska or large parts of Canada, due to aeronautical fixed service allocations north of the 60th parallel. There's absolutely no chance for transatlantic DX, given the megawatt longwave broadcasters (LWBC) there.

To avoid LWBC, one must look below 148.5 kHz. As it turns out, 130-160 kHz is allocated to similar services as 160-190 kHz. Avoiding ship assignments might make for a narrower band, but would still leave room for serious experimentation.

A longwave ham band would be valuable to experimenters. It might also attract a new breed to the hobby, particularly if available to Technician Plus licensees. (There's lots more hands-on appeal to LF gear than a handie-talkie full of tiny surface mount components.)

Simultaneously, though, there is considerable benefit in preserving the challenge of Part 15 Lowfering. These two uses need not be mutually exclusive, whether through band sharing, or two separate bands. These may be a rare opportunity to have our cake and eat it, too, but it will take thought and planning, both by amateurs and other users of this unique chunk of spectrum. [End quote]

Transmitter Project Update

The overwhelming vote was "YES!" to the question of whether or not to present a construction project here for a simple LF transmitter. I am working on two approaches—a homebrew design, and a ready-to-build kit. I plan to present the homebrew design next month.

I'm happy to report that with only minor changes, the homebrew circuit can be easily adapted to work on 136 kHz. This will be of interest to many European amateurs who are looking for a low power transmitter for the new LF ham band available in many countries.

VLF RADIO!

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www.americanradiohistory.com
Finally, it's May! Even in the North, spring is here (barring any truly nasty surprises — when I lived in Wisconsin, I did see it snow in May). Things are getting noisy on the AM band, though it's still a good idea to keep checking the expanded band channels. But this is also the time of year the FM and TV channels start getting busy.

Sporadic-E skip is at its best beginning in mid-May. Look for signals on channels 2-6 beginning in mid-morning (around 9:00 a.m.), and again in early evening (beginning around 6:00 p.m.). Skip signals appear on the lowest channels first, and can be quite strong. On some evenings, I've been able to watch the entire newscast on KIII-TV channel 3, over 850 miles from my location. Incidentally, if you find TV skip signals on channel 6, it's time to check your FM radio.

In the South, tropospheric propagation can happen all winter long. In northern climates, the tropo season is just getting started. Tropo DX doesn't go quite as far (stations more than 400 miles distant are quite rare), but all TV channels can be affected. The best openings are likely when cold, stable high-pressure systems are about to be pushed off by an approaching low. The best tropo signals are in the early morning, right around sunrise. But if you aren't a morning person, there's often also good DX in the evening.

**Expanded-Band News**

Two more stations appeared with little notice in February, and a third is expected any day now. WPHG is on 1620 from Atmore, Alabama, and carries a program of Southern Gospel music. This station has already been heard in Europe and is now the loudest X-band operation at my location near Nashville. KRIZ is also on 1620 in suburban Seattle with light urban music. Internet reports suggest KRIZ isn't all that strong and may be using 1 kW full time, instead of the 10 kW day power authorized for all expanded-band stations.

Finally, KKSL-1640 is expected to come on the air in suburban Portland, Oregon, by the time you read this. Oregon and Washington are tough states to log here in the East. KKSL and KRIZ should be popular loggings. WTDI-1670 in Wisconsin has not yet appeared on the air.

There have been changes to each of the two original X-band stations, too. 1310 kHz in Oakland was the longtime home to soul station KDIA. In February, 1310 changed calls to KMKY. The legendary KDIA calls are now on the former KXBT-1640.

In the NYC area, the first X-band station, WJDM-1660, had been carrying the Radio Aahs children's network. Radio Aahs went out of business in February. WJDM (and the other former Aahs affiliates) has been carrying a rather exotic variety of music from the former Aahs headquarters in Minneapolis. Overnight (6pm-6am Central Time), they've been carrying the programming of "Beat Radio." Beat Radio was originally a pirate operating on 97.7FM in Minneapolis. They were "busted" by the FCC, but have now found a legitimate way onto the air. Beat Radio programs a dance music format.

**Bits and Pieces**

A few months ago, I reported a situation in Asheville, NC, that had two licensed stations competing for use of the same FM frequency. Zebulon Lee had won a permit for the use of 96.5 MHz in three hearings. But before a final hearing could be held, the FCC's hearing rules were overturned in court. Lee, who felt he'd legitimately won the license, refused a suggestion he enter into a partnership with the other applicants. He applied for call letters and put WZLS on the air himself.

Shortly thereafter, the FCC awarded the frequency to the other applicants, and granted them call letters. They built another station — also on 96.5FM — and put it on the air. Both stations operated on the same frequency for 24 hours, before a temporary court order shut down Lee's operation.

Now, WZLS has been returned to the air. Shortly before Christmas, a U.S. Appeals Court in Washington ruled the FCC acted improperly in granting the competing application. The Commission announced they would not challenge the ruling and would undo the changes.

We've had some interesting early-season E-skip openings already in 1998. Here's hoping there will be plenty more as you read this! Let us know what you're seeing and hearing. Send your loggings, news, and DX photos to: American Bandscan, Box 98, Brasstown NC 28902, or via the Internet at my new address: w9wi@bellsouth.net
The number of local pirates operating in the 88-108 MHz FM broadcast band has been skyrocketing in the United States. FCC Chairman Bill Kennard has estimated that several hundred are currently active. The low powered "micropirate" phenomenon is probably the biggest news of the year in unlicensed pirate broadcasting. Every month our readers send in several articles in newspapers across the USA that discuss local FM pirate operations.

For instance, Artie Bigley of St. Louis and Mike Jaeger of Des Moines found stories about Radio Tejas, a right-wing "clandestine" station on 95.9 kHz in Missouri, and Iowa City Free Radio on 88.7 MHz in Iowa. Maury Midlo found information on Texas pirates using 95.9 MHz from Austin and 105.9 in San Marcus.

The situation in my hometown of Cleveland is a good illustration. Five pirates are consistently active on a daily basis. The oldest, Grid Radio, transmits continuous dance music on 96.9 MHz from a night club located in the warehouse district of downtown Cleveland. Four other pirates are all commercial stations (!) with a Puerto Rican Hispanic format, using transmitters located in neighborhoods on Cleveland's near west side.

WSPL on 90.7 MHz is the oldest of Cleveland's Hispanic stations. It programs salsa music with DJ's, as do its competitors Radio Coqui on 91.9 MHz and Radio Sabor Latino on 93.7 MHz. Radio Maranatha also airs salsa tunes on 89.9 MHz, but its broadcasts are dominated by Spanish language religious programming.

Personnel from licensed broadcast stations in northeast Ohio have complained to the FCC about the pirates, citing interference claims. So far the FCC has not acted to close down the microbroadcasters. A similar situation prevails in cities across the United States. If you haven't scanned through the FM broadcast band lately, you could be missing some highly unusual pirate activity.

Rodger Skinner of TRA Communications Consultants, Inc. advises that he has filed a Petition for Rulemaking to create a lower power FM broadcast service that would emphasize local ownership of the stations. If you'd like to view the text of his petition, given number RM-9242 by the FCC, http://www.concentric.net/~ratodtv has the material on the internet (see p. 4 for more).

### Shortwave Pirate Frequency

Despite concern in pirate circles that the main 6995 kHz pirate frequency might be used at times by licensed shortwave broadcasters, such out-of-band SWBC transmissions had not materialized by our magazine's press time. Thus, if you're trying to hear pirates, the area between 6945 and 6970 kHz is still the best place to look. About 95% of all shortwave pirate activity remains in this area of the 43 meter band.

There have been experiments on other frequencies lately. WREC has been moving to 6850 kHz at times. Some broadcasts by Jerry Rigged Radio have been widely heard on 9965 kHz. With sunspot activity slowly increasing and with the return of longer spring and summer daylight hours, it's likely that some stations will operate just below the 19 meter broadcast band between 15010 and 15090 kHz. Sometimes the stations have given announcements on 6955 kHz before they move to unusual frequency ranges.

The most widely heard shortwave pirate remains Radio Metallica Worldwide. Dr. Tornado and Señor El Niño use a very powerful 10,000 watt transmitter, so they have been heard throughout North America and other world regions. Most operations are in the area around 6955 kHz, usually using AM modulation. Occasionally Dr. Tornado fires up the upper sideband mode of his transmitter. If you hear Metallica, reception reports (including three first class USA stamps for return postage) are welcome via PO Box 109, Blue Ridge Summit, PA 17214.

### New Pirate Web Sites

A couple of pirate stations send word that they are operating new pirate web sites. You can find Trans Atlantic Radio at http://home.wxs.nl/~trans from Europe, while http://www.angelfire.com/ne/actionradio is the site for Action Radio in the USA.

Many dozens of pirates maintain internet web sites, with audio from their broadcasts on a few of them. An excellent place to find references to pirate internet activity is the Free Radio Network site using the http://www.frn.net/ URL. Another interesting "grassroots" free radio networking site is found at http://www.radio4all.web.net from the A-Infos Radio Project.

### New Moidrop

An unusual new station, Radio Neenhentchrin, is the first client of a new pirate maildrop for reception reports. PO Box 344, Bremen, IN 46506 has joined the ranks of the more established drops. QSLs have already materialized from the new station, as we see here, so this address has been verified. The other major maildrops used by North American pirates remain PO Box 452, Wellsville, NY 14895; PO Box 28413, Providence, RI 02908; Blue Ridge Summit (see above), and PO Box 293, Merlin, Ontario N0P 1W0.

### Thanks!

Reader input is always welcome via PO Box 98, Brasstown, NC 28902, or via e-mail address atop the column. We thank the following radio hobbyists for material used this month: Radio Animal, Pittsburgh, PA; Shawn Axelrod, Winnipeg, Manitoba; Artie Bigley, St. Louis, MO; Rainer Brandt, Hoefer, Germany; Dean Burgess, Manchester, MA; Pete Caron, Easton, PA; Jerry Coatsworth, Merlin, IA; Rich and Talea Jurrens, Katy, TX; Kevin Klein, Neenah, WI; David Krause, Eastlake, OH; Greg Majewski, Oakdale, CT; Bill McClintock, Minneapolis, MN; Maury Midlo, Wimberley, TX; Don Moore, Duvensport, IA; Kevin Nauta, Grand Rapids, MI; Gary Neal, Sugar Land, TX; Dick Pearce, Brattleboro, VT; Robert Ross, London, Ontario; Hank Schott, Newtown Square, PA; Lee Silvi, Mentor, OH; Niel Wolfish, Toronto, Ontario, and Andrew Yoder, Blue Ridge Summit, PA.
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FR-465 Cherokee

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May 1998 MONITORING TIMES 69
Making the Case for Novice

There are many advantages to obtaining and using a Novice license in preference to a “No Code” Technician ticket. Unfortunately too many amateur Elmers, in their zeal to add new calls to the ranks, stress the No Code ticket as being the best way to go.

I do like the No Code ticket for several reasons. First, it provides easy access to allow technically adept people to experiment with radio and learn more about the hobby. The No Code ticket is also ideal for the wife or kids who want to keep in touch with dad, but are not interested enough in ham radio (at the moment) to take on the burden of learning the code.

But, the Novice offers advantages beyond the ability to get on the air and chat with locals or to hope for DX in the off chance six meters opens up.

When the Novice ticket first became available in the early 50s it allowed the new ham to operate 80 meter CW, 11 meter CW, and 2 meter phone/CW. The novice transmitter was allowed 75 watts power input and had to be crystal controlled. In addition, the license was good for only one year; at the end of that year the novice had to have passed a test for technician or higher grade of license or he was off the air.

The new Novice license is a vast improvement over the original. It is now a five year renewable license, allows CW on 80, 40, 15 and 10 meters, and FM on 222 MHz with power of 200 watts. VFO controlled.

As a Novice you can expect to work transcontinental and international stations. Typical daytime range on 80 is 3 to 400 miles; 40 extends this to 1000 miles or so; and 15 and 10 meters permit contacts almost anywhere on earth. Nighttime range on 80 extends from coast to coast. International contacts on this band are fairly rare, as many countries outside the U.S. and Canada are not allowed within the Novice bands.

At night 40 meters does permit some intercontinental contacts, but such contacts are rare due to interference from SW broadcast stations near these frequencies. Fifteen and 10 meters will usually close down a few hours after sundown, except during periods of high sunspot activity (coming soon!). 222 MHz is of course limited to local contacts most of the time with occasional openings of a thousand miles or so in distance.

To obtain a Novice license you need to pass a very basic theory test. Typical study time of a week or less is required to obtain the knowledge to pass the Novice theory exam. There is a five word per minute code test required which on the average will take a month or two of concentrated study to pass—a small price to pay for what you will receive in return.

There are many aids to learning the code. Several different computer programs are available that will really ease the way for you. There are many code training programs on tape, although the computer is really preferred as a code teacher. Many ham clubs offer code and theory training. And, of course, there is always the individual Elmer.

If you can find a personal Elmer, so much the better, as one-on-one teaching can be very rewarding. Typically, the Elmered ham will have a leg up, since this personal coach will most likely offer use of his station while you are in the training period. He will help you overcome the fear of making that first contact, as well as showing you proper operating techniques—which few of the other methods offer.

After receiving your Novice ticket, a few months of regular operation and study will see you on the way to a General or higher class license with all of the attending privileges.

Compare this to typical VHF operation wherein normal contacts are local (i.e., a hundred miles or less) and there is little opportunity to work DX greater than a few hundred miles except during periods of exceptional conditions on six meters.

A Novice station can include almost any of the transceivers being offered today as they usually are limited to 200 watts or less. Or you can cheapen things up by going for used gear at your local hamfest. Expect to spend from $200 dollars up for used gear and $450 and up for new. Remember, this gear will be usable after you get your general, advanced, or extra class license, too.

Don’t short change yourself: take advantage of what the Novice ticket offers. Elmers, take note and encourage the newcomers to go for the Novice and help themselves to more fun!
Cherokee’s Terrific Family Radio Service FR-465

The new Cherokee FR-465 from Wireless Marketing offers just about everything you might want in a Family Radio Service handi-talkie, and all of it executed with spit, polish, and innovation.

To begin, the FR-465 is scarcely bigger than a deck of playing cards: less than 4" tall (excluding antenna), less than 2-1/2" wide and less than 1" thick. At about 8 oz. weight, this radio is truly small and light enough to drop in a pocket and forget that it is there. Everyone who has seen the FR-465 has commented on its high quality look and feel. The entire body of the handi-talkie is covered in a rubberized silicone material of the same type that you’ll find on extremely high-end binoculars.

On the front of the FR-465 are seven well-spaced soft rubber pushbuttons, a liquid crystal display, and an opening for the speaker and microphone. On the top of the radio are the antenna, an on/off/volume knob, and a rubber flap, under which you’ll find connectors for an external speaker microphone. On the right side is connector for an external power supply with a protective rubber flap. On the left side you’ll find a push-to-talk button and a function button.

On the back there is a belt clip and hand strap as well as a panel that slides away to provide access to five AAA batteries. On the bottom of the handi-talkie is a lock for the battery compartment and three connectors for a drop-in battery charger.

In designing the operating software for the Cherokee FR-465, the folks at Wireless Marketing have really struck a happy balance between simplicity and sophistication. On the one hand, a novice can simply turn on the hand-talkie and use the arrow buttons to change channels and the push-to-talk button to transmit. The auto-squelch takes care of the noise. This is the soul of easy operation.

On the other hand, by using the function button in combination with the seven buttons on the face of the radio, an advanced user can access a wide variety of sophisticated options to meet a range of communications needs. For example, the FR-465 has the ability to set CTCSS tones for either transmit and receive (or both), so that members of a group will only hear those transmissions that are intended for them.

In addition, unlike some competing FRS rigs, the FR-465 can set a CTCSS tone for one channel and not for another. This radio even has the capability to set different tones for different channels, and tones can be set for a channel and then turned on and off without going through the entire tone programming sequence — very handy!

One feature allows dual watch monitoring of two different channels. There are also scanning and memory features as well as the capability to set a transmit time-out limit, a feature that disables the transmit function while receiving a signal, a power save feature, and a programmable call channel.

Another slick feature makes this tiny transceiver ring like a telephone when a call is received. Press two buttons, the FR-465 changes from displaying channel and tone numbers to displaying channel and tone frequencies. All of the capabilities of the Cherokee FR-465 are explained in an extremely well written instruction booklet that never leaves the reader lost.

But aside from its good looks and wealth of features, the performance of the FR-465 is top-notch. The receive audio is loud and clear, and no other FRS radio offers greater transmit range (although some are its equal). And best of all, it’s in a package that can be slipped into a pocket on a moment’s notice and used anytime.

During my testing of the FR-465, I took advantage of its easy portability. My wife had sprained her back and was confined to bed for about three days. While I tried to maintain the household and look after our son, an FR-465, carried in my shirt pocket, was my constant companion. My wife had its twin in bed with her. When she needed something, she could key the microphone and communicate with me instantly anywhere in the house or yard or even while I was running an errand to a nearby store. Once you start exploring their possibilities, new uses for FRS radios keep popping up all the time!

The folks from Wireless Marketing have really done their homework on thinking about the FR-465 as part of a radio system. There are a whole host of accessories and options for this radio, including Nickel metal hydride batteries, a drop-in charger, a cigarette lighter powercord, a waterproof speaker microphone, a voice-activated headset microphone, and a variety of cases to protect the radio. I have tested many of the accessories, and they all live up to the high standard set by the FR-465 itself.

The suggested retail price for the FR-465 is $179.95 (Grove has it for $139.95), $59.95 for the metal hydride battery pack, and $89.95 for the drop-in charger. For additional information, contact Wireless Marketing at 1-800-259-0959.
ANTENNA TOPICS
BUYING, BUILDING AND UNDERSTANDING ANTENNAS
Clem Small, KR6A

You Need dB Aware of Decibels

This month let’s take a look at decibels. Perhaps we can even learn something about antennas and radio communications in the process.

First Things First

The “deci” in decibel refers to the fact that a decibel is just 1/10 of a bel. The “bel,” a relative measure obtained by comparing two power levels, is named in honor of Alexander Graham Bell. The decibel (dB) scale is based on logarithms, and handles the range of values encountered with human hearing better than linear scales do.

For this reason bels and decibels are utilized extensively in telephone, audio and radio work where the electrical signals measured are to be converted to sound waves. Bel and decibel values can be obtained from voltage, current or power levels, but the equations in each case are constructed such that we are always comparing of two levels of power.

Let’s have an example. The S-meter on your receiver indicates the relative power received from the incoming signal to which it is tuned. The basis of the S-unit scale is the decibel. Although there is not complete agreement on the definition of an S-unit, one S-unit is generally accepted as equal to six dB. To be useful, all S-meters should give comparable measurements in comparable situations. Thus the S-9 level on all S-meters is calibrated to represent a value of 50 microvolts of received signal. Received signal strengths are then understood to be scaled on the S-meter as compared to the 50-microvolt level of S-9.

However, decibels are a comparison of power levels, so let’s talk about watts. A 50-microvolt signal will yield 50 microwatts of power at the 50-ohm input resistance of your receiver. Let’s say we receive a signal which measures 3 dB over S-9. On the decibel scale a 3 dB value represents a twofold change in power. So 3 dB higher than S-9 is twice 50 microwatts or 100 microwatts received. We report that as “S-9 plus 3 dB.”

When the received signal power is decreased twofold as compared to S-9 it would be 3 dB (one-half S-unit) below S-9. A fourfold decrease compared to S-9 would be 6 dB (1 S-unit) below S-9. Of course we’d just report that as “S-8.”

Luckily, we don’t have to worry about changing watts to dB to use an S-meter. We just read its face value and report it.

Antenna Gain

“Gain” is a term used to indicate the relative response of a receiving antenna to an incoming signal, or the relative strength of the field created when a signal is transmitted by that antenna. Gain indicates how the antenna under test compares to another receiving antenna receiving or transmitting the same signal in the same direction, and at the same vertical angle.

Two standard antenna designs are generally used for comparison to measure antenna gain. One standard is our old friend the

### TABLE ONE

<table>
<thead>
<tr>
<th>ANTENNA</th>
<th>GAIN dB</th>
<th>GAIN dBi</th>
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</thead>
<tbody>
<tr>
<td>ISOTROPIC</td>
<td>0.0</td>
<td>-2.1</td>
</tr>
<tr>
<td>QUARTERWAVE</td>
<td>7.0</td>
<td></td>
</tr>
<tr>
<td>GROUND PLANE</td>
<td>3.3</td>
<td>2.7</td>
</tr>
<tr>
<td>DIPOLE</td>
<td>2.1</td>
<td>0.0</td>
</tr>
<tr>
<td>5/8 WAVE</td>
<td>3.3</td>
<td>2.7</td>
</tr>
<tr>
<td>GROUNDPLANE</td>
<td>3.3</td>
<td>2.7</td>
</tr>
<tr>
<td>2-ELEMENT QUAD</td>
<td>9.0</td>
<td>7.0</td>
</tr>
<tr>
<td>5-ELEMENT YAGI</td>
<td>10.1</td>
<td>8.0</td>
</tr>
</tbody>
</table>

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...or cliff, and use this to reflect signals between stations in an angular path rather than the direct, straight-line path we usually think of at these frequencies.

This Month:

Scatter propagation might well have been mentioned above as an application where the transmitting antenna affects the route of the signal to the receiving antenna. Why? What is scatter propagation?

You'll find an answer for this month's riddle, and much more, in next month's issue of Monitoring Times. "Til then Peace, DX, 73..."
Revisiting the Hombrew Computer

If you ever hankered to build your own IBM-PC-compatible computer, this may be the time. Prices have never been lower and information has never been easier to get, and the satisfaction is indescribable.

Refer to my four-part MT series (Nov-95 to Feb-96) on rolling your own PC. If you don’t have those issues, you can get reprints ($3 each) from MT. This series is the foundation of this month’s update. Details have changed since then, but the mechanics and principles of building your own PC remain sound.

The Changes

The 80486 CPU and low-end Pentiums, P60 through P120, are obsolete and unavailable now. The Pentium 133 is headed for obsolescence and may be gone by the time you read this. Industry sources say the entry level CPU is now the Pentium 166, so that’s your clue to buy or build nothing less than a 225 MHzx computer.

While 8-MB (even 4-MB) was adequate for 486’s on MS-DOS or Windows 3 1, there is no escaping the absolute minimum of 16MB now and 32MB, if you’re smart. Frankly, 64MB isn’t overkill. Fortunately, RAM prices have dropped. A pair of 72-pin/60-nS/16-MB SIMMs (32-MB total) goes for $60 or less.

You need a large hard disk drive. Anything under a gigabyte should only be a slave drive. The basic master drive (C:) should be 2.1GB, cost of which is a bit over $100. Cheer up! In 1983, Radio Shack’s 5MB hard disk cost a whopping $2500. Five or six years ago, a 345-MB drive was $400.

Two years ago, I suggested a 486 for economy and ease of construction. The Pentium was just coming on strong. Now I recommend building for all the power your budget can handle; that is, put a little more in and get a lot more out. I don’t recommend building in the bargain basement anymore because by the time it’s built, it’s outdated with little resale and growth value. The sweet spot for home-brew seems to be right in the middle of the technology curve. Stay away from the bottom because of poor value, and avoid the avant-garde top because you’ll pay too much. A middle-of-the-road Pentium 200MMx computer will be very powerful and competitive for the next two or three years.

Prices on CD-ROMs, network, sound, and video cards have tumbled, but steer clear of the innovative leaders, if “bang for the buck” is important. A 6x CD-ROM, 16-bit sound card, and 2-MB video accelerator are all in the neighborhood of $50 or less. There is little to be gained with the latest 34x CD-ROM and superwhizbang sound and video cards. Be conservative with add-on cards.

Yet, be liberal with the case, power supply, CPU, hard disk, and RAM. Mini-tower and desktop cases can be justified. Undersized disks and RAM are a disservice. The power supply should be 225-watts or greater, though anything over 300-watts is probably overkill. A large, full-size tower case is ideal for those who crawl in and out of their computers all the time. (Like me.) Look with a jaundiced eye at those ultra-modern, sleek "designer" cases with racing stripes and exhaust flames. Stick to the beige plain-jane mid or full size tower cases if you are an experimenter.

You need room in which to work.

Forget 5-1/4" floppy drives; they’re outmoded. A combo 3-1/2/5-1/4" floppy drive (both drives in a unit) is fine if 5-1/4" disks are still in your picture. Otherwise, a cheap 3-1/2" floppy will do.

The Motherboard

The motherboard is the heart and soul of a PC. Get a good one; not a cheapo. You stand a good chance of not going wrong if the motherboard comes with one or two Universal Serial Bus (USB) ports.

I know, Windows 95a doesn’t support USB (Windows 95b and Windows 98 do!) and few peripherals are available yet, but USB is the coming thing to replace the archaic serial I/O circuit. USB will be commonplace in two years. If your motherboard is equipped with USB and an Intel 430HX “chipset,” you will probably be okay. Watch the cache, though! Some boards come with 256K cache, but that’s not enough. Stick on S128B external cache memory. 1MB is probably overkill and costly.

Figures 1 and 2 show what I think to be representative of a good quality motherboard. The Tyon Tomcat IV comes with 512KB cache, an Intel 430HX chipset (best all-around chipset to date), and support for Cyrix, AMD, and Intel CPU speeds of 75 MHz through 233 MHz. Also standard on-board are four 32-bit PCI slots; five 16-bit ISA slots; two PCI bus-master enhanced IDE ports for four hard disk drives plus an EIDE CD-ROM; on-board I/O with IR; dual floppy drive port; two 16C550 high speed serial ports; one ECP/EPP high speed parallel port; two USB ports rev 1.2; one IR port; and a PS/2 mouse port. The Tomcat IV comes with cables and choice of Award or AMI BIOS. The price is roughly...
$140. Add RAM and CPU to round out the board.

If I’m talking over your head here, relax — just check the specs of the prospective motherboard to ensure that their jargon matches mine. Understanding this stuff isn’t as important as having it.

**The Peripherals**

A great computer for radio starts with a good case, power supply and motherboard, with middle-of-the-road CPU and plenty of RAM. And you can almost stop there, since the rest of the stuff is so cheap that even if you make a mistake, it won’t be a catastrophe. Still, there is a bit to know.

For instance, there are two kinds of prices on hard drives, CD-ROMs, sound, video, and network cards. One price is for the retail consumer and comes in a shrink-wrapped box stuffed with promo literature and books that never get read. For example, a Soundblaster AWE64 in the box costs roughly $100. But the OEM version (same thing) without box and frills is under $70. If you settle for off-brand, you can get the same thing for under $20. I am very impressed with a no-name $15 sound card I snagged from Fry’s Electronics.

Brand-names are not too important for sound, network, and video cards. I would stick to name brands for hard disk drives, though, including Western Digital, Maxtor, Seagate, Fujitsu, Quantum, and IBM.

**Price Guide**

Table 1 shows a sampling of prices you can expect if you “roll your own.” Where possible, I listed ranges. If you see prices much higher, beware: they’re too high. You might find lower prices — I tried to not low-ball my guide. I just want to keep you from paying too much.

From Table 1, it can be seen that a do-it-yourself Pentium PC can cost about $800, less monitor, if you have to go out and buy everything. This might not be much of a deal! Fry’s Electronics offers a ready-to-run Supercom Pentium 200Mmx with 16-MB RAM; 2.1-GB HD; 24x-CD-ROM; Diamond Stealth 2-MB video; 16-bit full duplex sound card; 56-kB/s modem; speakers, keyboard, mouse, and Windows 95; all for $850, less monitor. I bought one for a client because I couldn’t beat the price and provide Windows 95, too!

You can beat the price if you have any surplus parts. Even a case, power supply, keyboard, and mouse are a good start to saving money when rolling your own. Every little bit helps! Maybe it’s time to recycle those old 286/386/486 computers into a cost-effective upgrade...

**Other Clues**

Don’t count on older RAM. Pentium computers require 72-pin (or 144-pin) RAM rated at 60-nanoseconds or faster. Older RAM isn’t likely to be useful. Don’t even think about a primary disk drive smaller than 512-MB. Get a larger, faster, more reliable drive for your valued programs and data.

Monitors have dropped in price. A 17” SVGA is the sweet spot now. I have a 15” Trinitron™ that impresses me, but your eyesight and yen for value should focus on 17” monitors.

Motherboard “chips” are very important and Intel’s 430HX is the best yet for the Pentium 133-233Mmx CPUs. Insist on the 430HX unless you know exactly what you want!

Table 2 lists a few power-breakfast resources to support your PC-building adventure. Don’t buy a book on this subject — computer books go out of date too quickly now.

**Networks**

If you have two or more PC’s, you should network them for the tremendous values of synergy and experience. Anyone can set up a small local area network now. I’ll get into the nitty-gritty of LANs next month so watch your topknot and stay tuned; cool stuff is coming down!

**Support Notes**

If you can’t hit my published Internet sites, go to http://ourworld.compuserve.com/homespages/bcheek where the current addresses for my better Web and FTP sites will always be posted. You can e-mail me for current addresses, too.

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Note to U.S. consumers only: It is unlawful to import, manufacture, or market cellular capable or cellular restorable scanners into the U.S.
Making a Station Engineering Manual

This month we will be looking at ways to make life a little easier around the shack by documenting exactly what is in the shack in an engineering manual.

The idea of compiling all the technical data for everything in a facility is not new. In the US Air Force, we had Facility Training Manuals that detailed everything in our technical control facility. Microwave and ground radio maintenance, flight facilities, inside/outside plant maintenance and AUTOVON/AUTODIN maintenance all had their FTM.

Broadcast stations where I’ve worked had similar volumes dedicated to how the station was wired, what cable pairs were used, where, how the station was wired, what cable pairs had similar volumes dedicated to them. There were maintenance, flight facilities, everything in our technical control facility.

Organization is one major reason for creating a station engineering manual. A reference source on how everything in the shack is interconnected can help you solve problems quickly when they arise. I know for a fact that big gun contesters and DXers all have station engineering manuals where the operator can go to find out how the antenna rotors are wired, coaxial cable routings, mic/headset pinouts, rig schematics/manuals, etc.

This month, we are going to embark on the technical documentation of my station at K7SZ, to give you an idea of how to how compile a station engineering manual. This will be a good exercise for me as well, since it has been over three years since I have updated my documentation, and a lot has changed in those ensuing years. My wife says that I change radio gear faster than most women change shoes!

I enjoy buying and/or trading gear. I have a special place in my heart for tube-type (“boatanchor” or BA) gear. Restoring BAs has become one of the true pleasures of my radio pastime. I also like low power (QRP) equipment and selected shortwave gear. Therefore, my shack tends to change a lot as I restore a piece, use it for a few months, and trade it off for another piece. Still, this is no excuse for not having an up-to-date engineering manual.

Start at the signal

Where do you start? Start at the antenna and work backward to the AC outlet. Figure 1 shows how my antennas are arranged. For HF I use three primary antennas; a HyGain TH7DX 7 element Yagi-Uda type beam antenna for 20/15/10 meters, and an extended double-Zepp for 160/80/40/30 meters. A three element 6 meter beam by MFJ sits above the TH7 to give me directional capabilities on the "magic band."

Notice that I have also included an end-fed wire (my clothesline antenna, actually) along with omidirectional antennas for 2 and 1.75 meters. In addition, there is a Lakeview VHF/UHF discone omni antenna sitting a few feet from the 35 foot tower on my property. This makes a total of seven antennas in use at K7SZ. The extended double-Zepp does double duty as a SW antenna.

Coaxial cables from the antennas are sequentially numbered and noted in the engineering manual. Notice that the Zepp antenna is fed with 450 ohm ladder line which is not easily confused with coaxial cable. While the coax cables enter the shack through a 3 inch pipe/feet through the ceiling, the Zepp’s ladder line and the end-fed “clothesline” wire antenna come in at the bottom of the shack window. The end-fed wire is connected directly to the Heathkit SB-310 shortwave receiver.

The TH7DX triband beam antenna cable is connected to a dual position Alpha-Delta antenna switch. The other position of this switch is left unterminated. The output of this switch is routed to a Dentron MT-3000A antenna tuning unit. This ATU has a built in 300 watt dummy load, forward/reflected power metering and antenna switching for 3 coaxial lines, one end-fed wire, and balanced feedline. In addition, it is a big tuner, capable of handling 3 kilowatts! The ladder line from the Zepp antenna is also connected to the Dentron ATU at the "Balanced Line" input port.

The output of the Dentron MT-3000A is routed to another Alpha-Delta coaxial switch, this one having four outputs. Each output port is connected to an HF radio in the following order: Radio 1 - Wilderness Sierra multi-band QRP CW transceiver; Radio 2 - Ten-
Tec Century-22 CW transceiver; Radio 3 - Drake TR-4C SSB/CW transceiver; Radio 4 - Yaesu FT-301SD QRP SSB/CW transceiver.

Note the Ten-Tec Model 1208 6 meter transverter in line with port four of the antenna switch. The 6 meter beam antenna is connected directly to the transverter. Switching between the HF and 6 meter antennas is done at the transverter.

This antenna switching arrangement allows me to switch any one of the four HF rigs between the Zepp and beam antennas, providing great flexibility. All antenna switches and the Dentron tuner are grounded to the station ground bus, and the two Alpha-Delta switches also provide lightning and static discharge protection via their patented Arc Plug (™).

The other four antennas are routed directly to their respective radios. Lightning protection is provided by disconnecting the coax or wire and connecting it to station ground.

I have diagrammed the rotor cable pinout on the HyGain/Telex HAM-IV rotor to show which color wires go to which terminals on the rotor control box. This saves time and hassles in the event you have to work on the rotor control box or a wire comes off of a terminal.

### Power Sources

So much for the RF end of things. Now we proceed to the power distribution for the shack. Figure 2 shows the various power connections available at K7SZ. Eventually, all the AC and DC power supplies will be replaced with solar charged batteries, enabling the entire shack to be run off of 12 Volts DC with the exception of the Drake TR-4C, SB-310, the rotor control box, and the shack computer.

When I remodeled the third floor rear bedroom into a radio shack, I over-engineered the power requirements to the room. With the help of Joe Balutski, N3IKP, a master electrician, I ran a 30 amp service from the main service panel in the house up to the new shack. It is terminated in a seven breaker subpanel to provide power split-out to the operating and workbench areas.

The AC going to the operating area terminates in three groups of four dual 110 volt AC receptacles. Each of the four sets of receptacles is fused on its own 20 amp circuit breaker. The workbench area has two groups of five receptacles, both of which are separately protected by individual breakers on the subpanel.

A new station ground was installed using a continuous run of #4 copper wire from the subpanel directly to the AC service ground of the house. In addition, a separate, isolated ground and isolated outlets were installed for the computer to reduce noise and interference from the computer.

Finally, in the event I ever obtained a high power linear amplifier for HF, a separate 220 volt AC receptacle and circuit breaker was installed.

Twelve volt power is obtained for all the transistor equipment from a 15 amp regulated power supply, housed beneath the operating position. A separate 12 volt supply is used at the workbench. DC power distribution is provided by an MFJ 1118 DC power distribution box. This unit provides two high current (up to 30 amps) taps for transceivers and an additional six low current taps for accessories. Voltage is monitored via an analog meter on the DC distribution box. The MFJ 1118 is wired to the output of the DC power supply via a length of #8 AWG wire.

### Wired for Audio

Microphone audio connections for HF are done via a series of adaptor cables made to interface a Shure 444D mic to the Drake TR-4 and the Yaesu FT-301SD transceivers. The icom IC-21A 2 meter (146 MHz) and Midland 13-509 1.75 meter (220 MHz) rigs have their own mics which plug into their respective jacks on the radios.

For quick reference, I have included these jack/plug pinouts in Figure 3. In addition, I have included the basic wiring for the Shure 444D mic and the various adapter cables. Eventually, I am adding a Heil boom mic with dual HC-4/5 elements which will be directed via a multiposition switch to one of the four transceivers.

Receive audio from each rig can be patched to one of two Radio Shack DSP filter units which allows additional audio filtration. I can't say enough good things about these small, inexpensive DSP units from Radio Shack. Unfortunately, they are no longer manufactured, so your best bet is to find one at flea market or hamfest. Going rate is $20 to $25, and they are worth every penny.

The output from the DSP filter is passed to one of two Radio Shack Minimus Seven speakers. In the past, I have experimented with running receiver audio through a Sony stereo equalizer prior to the DSP units, but found that this additional step of audio conditioning was not really worth the effort.

Operations and service manuals for each piece of gear in the shack are also included in the engineering manual. This includes schematic diagrams, modification sheets, plus any correspondence with the factory or supplier. There are several ways to store all this newly accumulated information. I have used large three-ring binders, accordion files, and file folders in a filing cabinet. Of these methods, I like the filing cabinet idea best, since I have a lot of gear and three ring binders can get very cumbersome.

Thus concludes the overview of how I have my station arranged. I realize that your station may be much simpler or much more complex than mine, so use your imagination and plan your installation with flexibility and convenience of operation in mind.

Have fun and remember to Keep It Simple.
Data Frequencies in the Fed Bands

One of our monthly contributors, Ken Windyka, up in Springfield, Mass., writes to inform us of a very interesting Web Page. It is http://www.ntia.doc.gov. This is the web page of the National Telecommunications and Information Administration (NTIA) which performs the same function for the federal government that the FCC does for the private sector. This NTIA website provides a lot of information on federal government frequencies and the latest decisions of the government regarding telecommunications use.

One interesting item of note on the above website is the 1996 edition of the NTIA Manual of Regulations and Procedures for Radio Frequency Management, which is the bible for federal frequency management, federal communications systems planning and construction. Chapter 4 in this manual has a list of the “splitter” frequencies in the 162-174 and 406-420 MHz range. There are currently 78 such frequencies now available for all federal government agencies to use with an absolute minimum of coordination.

These are data channels only and no voice is authorized on any of these frequencies. Also note these frequencies have very low powered devices on them that are only capable of 5 to 10 kHz bandwidths.

Obviously, the typical scanner is not going to be able to enter a frequency like 162.803125 down to the last digit, but your scanner can come close. For example, you will have no problem hearing a signal transmitting on 162.590625 MHz even if you can only enter 162.590 or 162.595 into your scanner.

### More Shared Frequencies

The splitter frequencies mentioned previously aren’t the only shared frequencies in the government spectrum. Just as in the civilian VHF/UHF spectrum, the government has eight itinerant or multi-user frequencies that various agencies share.

The frequencies 163.100, 416.050 and 418.575 MHz are authorized for use by all U.S. government agencies and are there for intermittent wide area requirements of a transient nature. These frequencies do not require prior NTIA coordination.

Just above the 11-meter CB band are two more interesting government frequencies—27.575 and 27.585 MHz. These two allocations are used for intermittent, short distance, low power radio communications, signalling, and the radio control of objects and other devices by a variety of government agencies.

Finally, we have 168.350, 408.400, and 418.075 MHz. These frequencies can also be used by any government agency. They are authorized for use when the communications need by a particular agency does not justify the full coordination of an exclusive government frequency assignment.

These eight government itinerant frequencies should be loaded in every federal monitor’s scanner. You just never, ever know what you’re going to hear on these neat frequencies.

### National Interagency Fire Center

Some discussion on the FedCom list server regarding the National Interagency Fire Center (NIFC) reminds me it may be time to clarify the mission and purpose of this federal agency.

The NIFC was formerly known as the Boise Interagency Fire Cache. The name was changed in 1993 to more accurately reflect the center’s national mission. The old BIFC was organized several years ago to make better nationwide use of resources, including nationwide radio frequencies, when fighting a large forest fire. The initial use of the program was for fires on federally owned lands, such as national parks and national forests. This mission has now been expanded to include fires anywhere in the country; hence the redesignation of the NIFC name.

Here’s an example of what can happen with a common cache—and of the kind of activity you may be able to monitor. A few years ago during an extremely high fire season in New Hampshire, the NIFC sent a large tanker airplane to stand by in Manchester. Although it was never used in the New Hampshire area, it did see service in Massachusetts. In addition, part of the radio frequency cache that was located in Maine had been requested to a fire in southern New Hampshire. Although the fire had been expected to last quite a while, it was contained quicker than expected and the radio arrived after the fires were extinguished.

Here are some of the reported frequencies for the NIFC:

<table>
<thead>
<tr>
<th>Command net</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>C-1</td>
<td>170.975</td>
</tr>
<tr>
<td></td>
<td>168.700</td>
</tr>
<tr>
<td>C-2</td>
<td>170.450</td>
</tr>
<tr>
<td></td>
<td>168.100</td>
</tr>
<tr>
<td>C-3</td>
<td>170.425</td>
</tr>
<tr>
<td></td>
<td>168.075</td>
</tr>
<tr>
<td>C-4</td>
<td>172.250</td>
</tr>
<tr>
<td></td>
<td>169.875</td>
</tr>
<tr>
<td>C-5</td>
<td>171.500</td>
</tr>
<tr>
<td></td>
<td>169.175</td>
</tr>
</tbody>
</table>

### Incident Command Channel

<table>
<thead>
<tr>
<th>Command net</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>C-1</td>
<td>411.825</td>
</tr>
<tr>
<td></td>
<td>417.300</td>
</tr>
<tr>
<td>C-2</td>
<td>411.850</td>
</tr>
<tr>
<td></td>
<td>417.350</td>
</tr>
<tr>
<td>C-3</td>
<td>411.875</td>
</tr>
<tr>
<td></td>
<td>417.500</td>
</tr>
<tr>
<td>C-4</td>
<td>411.925</td>
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<td>417.800</td>
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### Division of Fire, Aviation, and Safety Channel

<table>
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<th>Frequency</th>
<th>Channel</th>
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<tbody>
<tr>
<td>01 168.550</td>
<td>Air calling simplex</td>
</tr>
<tr>
<td>02 168.625</td>
<td>Air guard simplex</td>
</tr>
</tbody>
</table>
Pantex plant for
of
thermonuclear
Hanger,
Pantex Facility. This the plant which
final destination
used
passes along
list
414.875 415.075
408.775 411.625
408.425 408.475 408.575 408.625
169.025/169.775 169.775/167.175
167.825/168.225 169.225/168.300
168.525/169.400 168.475/168.975
06
05
418.9500
167.7625
169.200 Air tactics simplex
166.675 Air tactics simplex
164.325 Simplex
164.275 Simplex
164.225 Simplex
164.5000
164.6500
164.7000
164.7500

Pantex Plant and other Reader Input

We previously addressed the frequencies
used by the Department of Energy in the
transportation of nuclear materials to their
final destination of Amarillo, Texas, at the
Pantex Facility. This the plant which is
operated by the contracting firm of Mason and
Hanger, Inc. and which disassembles
the thermonuclear weapons.

One of our loyal contributors, Chris Parris
of Texas, happened to be in the vicinity
of the Pantex plant for a few days recently. Here is
a list of his intercepts:

164.225 Simplex
164.250 Simplex
164.275 Main Security, both simplex and
repeater operations. Many alarm checks
164.325 Simplex
164.350 Tone and voice plant paging
167.825 Simplex
172.2975 Data/telephone. Lots of sensors around
the plant.
416.250 Simplex with telephone access

While we're in the area, Rob (KC51MN)
passes along the following intercepts from
Tyler, Texas:

167.7625 FBI Repeater out
418.9500 DEA Repeater out
418.6750 DEA Simplex
418.2250 IRS Criminal Div.
163.2090 U.S. Marshals
Service (Heavy use
of cellular telephones)
164.6500 Secret Service Simplex

More Reader Reports

Tom Filecco (KA2UCP) sent in these
intercepts for the New York area:

165.2375 Customs
166.9500 National Park Service FDR Residence,
Hyde Park, NY. The p/tone is 136.5
164.8000 VA Hospital paging
176.4125 FBI Repeater output

Moving out to the midwest, Dale Urban submitted
the following frequencies for the state of Kansas:

Immigration and Naturalization Service
163.625 Simplex
160.900 Repeater out
163.675 Simplex
163.725 TAC 1
163.775 TAC 2
163.850 Simplex
163.750 Simplex

U.S. Marshal Service
163.200 OPS 1 Repeater out
163.8125 Repeater in
164.100 Simplex
164.600 Simplex OPS 3
162.7125 Simplex OPS 6
162.7875 Simplex
170.750 Court Security
170.850 Court Security

Over in the Roanoke, Virginia area Peter
Vieth submitted the following information regarding the FBI. The main frequency used is
170.900 MHz. The p/tone is the normal FBI
tone of 167.9 Hz. One side of the conversation
was in the clear; the other side was digitally scrambled. Much encryption
was heard on this frequency, usually in conjunction with
167.5875. Both frequencies appear to be
repeater outputs.

South Florida Activity

Some new federal frequencies have appeared
in the South Florida area. The DEA is using
418.9, 418.75, 419.325 very heavily (Ft.
Lauderdale and Miami). Up in the West Palm
Beach area, DEA has started using 411.125
MHz as a simplex frequency. This comes from
our resident monitor in Jupiter/Tequesta.
Florida. Many thanks to “Lokutis” for this info.

The 411.125 MHz channel is used in the
Miami as a simplex base station frequency.
DEA is also using a repeater pair of 413.975
input and 419.225 output in Miami. The HDTA
(High Density Drug Traffic Area) frequencies
are showing use in South Florida. The following
frequencies are showing some life:

414.025 Simplex
414.05 Simplex
414.125 Repeater input paired with 414.460
repeater output
414.600 Simplex
416.375 Simplex
417.0375 Fema
418.075 Government buildings frequency
418.775 Repeater out
418.925 Repeater out
419.820 Repeater out
419.525 Paired with 419.125 input

Several Secret Service frequencies have
been heard testing in the digital mode in the
South Florida area. They are:

164.65 TANGO Channel 4 repeater out
165.2125 MIKE
163.375 CHARLIE
166.400 GOLF

The common repeater
input to 169.375. This
repeater is located
near Homestead Air
Force Base.

The U.S. Customs Office of Export
Control has a repeater at Miami International
Airport. Traffic has been noted on it. They use
these frequencies:

410.875 Repeater out
416.175 Repeater input

To conclude this month, the frequency of
164.550 MHz is a most interesting channel to
monitor down in South Florida. It is a U.S.
Coast Guard intelligence frequency, but a
variety of agencies have been heard on it,
including IRS, Customs, Florida Highway
Patrol, and FBI. This frequency bears
watching (or listening).

And finally, when the Attorney General
Janet Reno came back to town to visit her
family (yes, she is from here), the following
protection frequencies were monitored:

166.525 Treasury units ID of DELTA 300
166.750 Same as above

www.americanradiohistory.com

May 1998 MONITORING TIMES 79
Welcome aboard! Today we shall continue with our look at air traffic controllers’ (“tracon”) tools of the trade. The radar room is somewhat more exotic looking than the tower cab we discussed last month, but does offer essentially similar equipment, except for the windows.

Controllers in this setting employ a strip printer for information about arriving and departing aircraft. They have telephones linked to the tower, to the center, to the National Weather Service, and to other airport operations; dedicated VHF bands and the shared UHF band, emergency frequencies; wind indicators; the altimeter setting; the RVR indicator; and current weather information hookups. The major difference between the tower and tracon is the presence of the radar scopes.

**Terminal Radar** - This system has a range of 60 nautical miles and completes an antenna rotation (that is, it updates the picture) about every five seconds.

**Transponder and Interrogator** - The transponder is the part of the radar system that is carried on board the aircraft. The other half is an interrogator, which is usually attached to the radar antenna on the ground. The ground equipment interrogates the transponder on board the aircraft, which responds with a signal that is set to one of 4,096 possible codes. For example, if a pilot is told to dial in (squawk) 2016 on his transponder, the equipment will reply to the interrogator with a signal that will be interpreted as 2016. In most operational transponders, part of the signal to the ground will include the aircraft’s altitude in hundreds of feet as well.

**Computer Data Blocks** - The target derived from the transponder signal overlies the primary target so that they are almost indistinguishable. The computer identifies the discrete transponder code 2016 as one assigned to a specific aircraft (say, Delta 124), and generates a data block for DL 124. The aircraft’s position is identified by a position symbol indicating which controller is working the plane. A short leader line connects the data block with the position symbol. The full data block contains the aircraft identification, its altitude, and its ground speed, which is calculated by the computer based on target movement.

**Trackball** - Controllers have a computer input device known as a trackball at each console. The plastic sphere that spins beneath the controller’s fingers and acts like the familiar computer “mouse.” Rotating the trackball moves the cursor on the radar scope to a target or piece of information the controller wants to identify to the computer.

This is one of several ways that information is sent into the computer. Data can also be identified by using the aircraft’s identification number or computer number in the data block. A keypad is also at each control position for controllers to use to key information into the computer system.

When a departure aircraft reaches a predetermined point after takeoff, the computer initiates an automatic handoff to the center. When the handoff is accepted by the center computer and control of the aircraft is accepted by that facility, the data block drops off the departure scope. Inbound aircraft are handed off to the approach controller from the center in a similar fashion.

**Automated Radar Terminal System (ARTS III)** - Major facilities employ the ARTS III. It uses primary radar returns created by bouncing the radar single off the surface of the aircraft, and secondary radar signals generated by a transponder in the aircraft.

**ARTS III Software** - The ARTS III software incorporates two significant enhancements. The first is conflict alert. It warns the controller that aircraft are about to lose separation; that is, to move too closely to each other. In the terminal area, aircraft operate so close together that the parameters for this software program are set virtually at the minimum. Therefore, when the alert goes off, it is usually too late to maintain the legal separation, but the warning allows sufficient time for the controllers to avert a potentially dangerous situation.

The second enhancement to the ARTS III software is the minimum safe altitude warning system. It sounds an alarm when the aircraft descends below the minimum safe altitude for the terrain in question.

**Video Map** - An integral part of any terminal radar system is the video map. It features a series of solid, dashed, and curved lines, boxes, and circles. Each symbol means something to the controller. After a little orientation, it is possible to identify the primary and secondary airports, the runway center lines, and the aids to navigation serving the airport and the local area. Also seen are the boundary of the facility’s airspace and subdivisions of that airspace, which play a part in the segregation of traffic, as well as prominent landmarks used as reporting points by Visual Flight Rules (VFR) aircraft. The video map seems as real to the controller as the picture seen out of windows.

That’s all for now. Next month, we’ll finish up on the tools of the trade subject and have readers’ input. Until then, 73 and out.
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May 1998 MONITORING TIMES 81
Sony Enters the Scanning Market!

Sony is showing its confidence in the scanner market by releasing two handheld scanners, the SC-1 and ICF-SC1PC (the same scanner but with computer interface). Features shared by both scanners are phase locked loop (PLL) triple conversion circuitry, 25 to 1300 MHz coverage (less cellular), 300 channel memory, AM and narrow wide FM reception, 10 "intelligent" scanable memories for storing signals continuously active for 5 minutes or more.

A variety of scanning options include lock-out of up to 100 frequencies to be skipped during scanning, one-button access to nine preprogrammed service bands (police, weather, marine, aircraft VHF/UHF, fire/emergency, FM broadcast, TV VHF/UHF sound), protection against accidental operation, and choice of bands, memories or priorities to be scanned. The non-computer capable SC-1 is slated to retail for $329.95.

The SC1PC with computer interface uses screens icons as a user-friendly assistant to perform custom searches, scanner control and programming, and creation and management of data files. A CD-ROM of FCC-licensed frequencies is provided along with the bi-directional interface cable and PC software. The list price for the computer version is $419.95.

Sony's new entries are expected to be available in April, and will be carried by your favorite radio dealers, including Grove Enterprises, which is advertising the SC-1 at $269.95 and the SC1PC at $329.95. For more information or to order call 1-800-438-8155, email order@grove.net, or visit www.grove-ent.com.

VisualRadio

One more entry into the brave new world of computer/radio partnership is VisualRadio, a Windows based software for computer-capable scanners and receiver/transceivers from AOR, ICOM, Kenwood, Racal and Yaesu, plus the WinRadioCard. Rhode & Schwartz and Watkins Johnson models are supported by the PRO version. The PLUS version of VisualRadio enables use of other two valuable radio accessories: the AOR SDU-5000 spectrum display unit and the Optoelectronics Scout frequency.
counter.

Besides radio control via the screen-based virtual radio, VisualRadio's strength lies in database management. The German-based company designed the program to work especially well with the Klingenfuss Super Frequency List on CD-ROM (see What's New? Feb 98), though it will import any number of Microsoft Access compatible databases.

Operation and advantages are similar to those of other radio control packages, such as automatic programming, automatic logging, recording of .wav files, database analysis, customizable searches based on any field, timer-controlled scanning, and much more. VisualRadio Ver 2.03 is $122, or $212 for the PLUS version (includes postage, so slightly less to Europe). To inquire about pricing for the PRO version or to learn more about VisualRadio, email VisualRadio@compuserve.com, visit the website at http://ourworld.compuserve.com/homepages/visualradio/ or contact general distributor Difona Communication GmbH, Att: Mr. Asmus, Sprindlinger Landstrasse 76, D-63069 Offenbach, Germany.

The Time and Temperature is...

One of the most valued office accessories of the MT editor is a digital clock which also gives the office temperature; it has helped resolve many disputes over the thermostat. (The outdoor temperature, however, is determined experien-
tially come five o'clock!)

When the old standby timepiece refuses to be resurrected last time, a tempting replacement will be the new Thermometer Clock from MFJ, giving 24 hour time and indoor and outdoor temperature in bold, 3/4 inch LCD characters. Another bonus feature is the MFJ-152's automatic update of the mini-
num and maximum temperature readings for the day. A memory function can also recall the minimum/maximum readings for a period of time you want to measure.

What better accessory could you give a ham than the ability to tell the time and temperature! Ten feet of outdoor sensor wire and mount is supplied to allow best placement. The MFJ-152 Thermometer Clock is $24.95 from dealers or call 800-647-1800 or email: mfj@mjenterprises.com.

Access To The Airwaves

Few pirate radio aficionados have held the spotlight as long—and as often—as Allan Weiner. His broadcasting exploits as "Radio NewYork Interna-
tional" aboard an old freighter off the New York coast caught the world's attention, and his recent acquisition of a legitimate FCC license was astounding, considering his reputation with the Commission. (See Global Forum ed.)
Throughout his life, from early childhood through adult confrontation with bureaucracy, Weiner has fought tirelessly for unfettered personal freedoms. But free speech on the airwaves was always his dominant theme. *Access to the Airwaves* is a personal chronology of Weiner's life as seen through his own eyes, and as told to Anita Louise McCormick.

McCormick is an accomplished writer and shortwave hobbyist, and her easy-to-read style combined with Weiner's liberal, sometimes counter-culture life style makes for compelling reading, unusual in an often predictable hobby niche like shortwave listening.

*Access to the Airwaves* is $17.95 plus $4.95 shipping from Looptanics Unlimited, PO Box 1197, Port Townsend, WA 98368.

**Morse Code: Breaking the Barrier**

Another way of gaining access to the airwaves is through an amateur radio license. But, learning the Morse code has always been the turning point for most would-be hams. The attitude of many licensees seems to be, "I learned it, so you should, too!" Whether you feel that the Morse code is an antiquated relic of an obsolete era, or the most fun a radio hobbyist can encounter, the fact remains that, at present, to be a world-class amateur licensee, you must learn it.

Dave Finley's 100-page book, *Morse Code: Breaking the Barrier*, is essentially a history of Morse code through the ages—a retrospective, illustrated look at the services and vintage equipment which utilized this mode in the past. Later on, there is an extensive section showing and describing more recent ham Morse equipment and accessories.

The part telling how to master the code is in the middle, roughly a dozen pages describing the Koch method of learning to recognize groups of dots and dashes rather than memorizing their individual sounds.

*Morse Code: Breaking the Barrier* is available for $14.95 plus shipping from MFJ dealers or directly from MFJ Publishing Company, Starkville, MS 39759; mfj@mfjenterprises.com.

**Line Isolator**

The Radio Works' new T-4G Line Isolator™ is an unbalanced, current-type device to reduce stray RF on a coaxial cable's shield. This unwanted stray RF is often the result of antenna imbalance or direct pickup from the antenna. Line isolators remove stray RF without affecting the signal carried by the coax.

Technically, the T-4G, a grounded line isolator, achieves the maximum possible isolation by providing a direct path to ground for stray RF traveling along the outer surface of the shield of coaxial feedlines. With the T-4G, stray RF on the coax does not see a secondary path to your station equipment because of the extremely high inductive reactance of the line isolator's windings.

If a direct earth ground is not available and the copper ground strap is not needed, the T-4 is available. The T-4 is inserted in series with coaxial cable connecting your transmitter to your linear and between your linear and your transmatch. RF in the radio room can cause TVI, RFI, and RF feedback problems and the installation of line isolators is often the best and sometimes the only solution to these problems.

The introductory price of the T-4G is $33.95 and the T-4 is $29.95. Complete information is available on the Worldwide Web at www.radioworks.com.

To request the paper version of the free Radio Works' General Catalog, email jim@radioworks.com or call 1-800-280-8327. You can also write or call the Radio Works at Box 6159, Portsmouth, VA 23703; phone 757-484-0140 or fax 757-483-1873.

**Antennas West: the legend lives on**

Owner Jim Stevens recently announced the closing of Antennas West, familiar to many readers for such wire antennas as the G5RV, TNT Windom, Picol, and TigerTail. However, the legend of these antennas will live on...

"One of the employees, Wayne Smith has retained the building and some of the stock, and is forming his own company," says Allen Lowe of Arrow Antenna. "He will be selling several brands of antennas including Arrow Antennas."

The address to contact is Antennas & More, 1038 South 350 East, Provo, UT 84606; 801-373-8426 phone/fax.

Lowe goes on to say, "Arrow Antenna has bought out most of manufacturing equipment and material and will be manufacturing some (not all) of the wire antennas that were made by Antennas West... All of the VHF and UHF aluminum antennas shown in Antennas West Catalog have been made by Arrow Antenna for almost five years, including the corner beams (corner reflector), the walking stick, the solid yagis, the rooftopper J, the tracking antennas, including the satellite antenna, and the fox hunt attenuator..."

Contact Allen Lowe NO1MW, Arrow Antenna, 1803 S. Greeley Hwy. #B, Cheyenne, WY 82007; 307-638-2369 phone, 307-638-3521 fax, for more information on these intriguing antenna designs or visit http://Members.aol.com/Arrow146/index.html

Books and equipment for announcement or review should be sent to "What's New?" c/o Monitoring Times, P.O. Box 98, 7540 Hwy 64 West, Brasstown, NC 28902. Press releases may be faxed to 704-837-2216 or e-mailed to meditor@grove.net.
The MFJ-418 Pocket Morse Code Tutor

Review by Skip Arey WB2GHA

Recently I had the opportunity to teach a ham radio license class. I was gratified to discover, despite common belief, that folks are still interested in learning International Morse Code. To get beyond the basic Technicians class license and to get access to amateur radio's HF bands, you still need the code. But many folks, including myself, find it hard to find the time to practice. The folks at MFJ Enterprises have come up with a device to make it possible to take code practice wherever you go.

The MFJ-418 is a diminutive, microprocessor-controlled box full of CW fun. Regardless of your skill level, this unit can serve to improve your overall code operating skill. Measuring just 2-1/4 by 4 by 1 inches, the unit fits easily into pocket or purse. The MFJ-418 is powered by one 9 volt battery. Audio gain is adjustable, and there is a headphone jack for private listening.

All aspects of the device's use are controlled by the power switch/volume control and three push buttons. From these simple controls you can set code speed from 3 wpm through 60 wpm. The speed can be adjusted "on the fly" without altering other settings during your practice. A series of simple menus allow you to set overall speed, Farnsworth style code practice (separate adjustment of character and spacing speeds), and tone.

You can set the learning style to suit your needs, from beginners to advanced to custom settings. The unit will send characters, groups, QSOs, words, callsigns and combinations. All of these audio features are further supported by the addition of a two-line scrolling LCD display that allows you to see what is being sent. It can be set to display the letters prior to sending the audio (good for initial learning) or audio first followed by the lettering. Included is an 18 page, detailed manual and MFJ's 12 month warranty.

I've been carrying this little box around with me for the last several weeks and I've had a ball with it. I keep it in my briefcase and grab about fifteen minutes of practice every day at lunchtime. My goal is to push for 35 WPM so I can start to hang with the big dogs on the bottom end of 20 meters. Meanwhile, my son borrows the unit for a few minutes each night to prepare for his Novice test. Now that's versatility!

I recommend the MFJ-418 for anyone who wants to learn and then go on to fully master the International Morse Code. It's $79.95 from MFJ Enterprises, Inc., 300 Industrial Park Road, Starkville, MS 37759, (601) 323-5869, Fax (601) 323-6551.

The MFJ-418 Pocket Morse Code Tutor

Techtoyz Micro RF Detector

Review by Haskell Moore, kb5wix@aol.com

The Techtoyz RF Detector is the third in a line of new, innovative electronic products housed in a pager-style enclosure from Optoelectronics. The previous two products include a DTMF decoder capable of storing 2000 digits and a frequency counter with a signal filter and three memories.

The RF Detector is a full featured electronic instrument in a very small, discreet package. In addition to displaying the signal strength of near field signals, it has several very useful options. For example, it may be configured with one of two beep modes, either sounding intermittently or continuously, when the adjustable threshold has been attained.

Depending on the user's preference, one of two display modes may be selected. In the digital mode, the ambient signal level, signal (audible beep) threshold, and maximum signal level are displayed simultaneously as standard numeric digits. In the bargraph mode, two 24-segment bars are used to display the information.

Finally, it also has the ability to keep track of the number of times (up to 250) that the signal strength exceeds the preset threshold.

Potential uses for the RF Detector include transmitter calibration, antenna tuning and placement, tracking stuck transmitters, electronic counter-surveillance (i.e., bug detection), RF safety monitoring (by using the audio alert function as an RF detector), radiation and emissions measurement (i.e., computer RF shielding), and coax leakage detection.

Specifications:
Frequency Range: 10MHz - 2GHz
Beep Alarm: Continuous or resettable
Hit Counter: 250 maximum
Signal Level: Displays maximum signal level attained
Display: Relative RF level (numeric or bargraph)
Dynamic Range: 30 dB minimum
Power: 1.5V AA Alkaline Battery (Approx. 15 hour run time)

The Techtoyz RF Detector sells for $149.00 (US). The optional, but highly-recommended external antenna is an additional $9.00. The full line of Techtoyz are available from Optoelectronics, 5821 NE 14th Avenue, Ft. Lauderdale, FL 33334 (800-327-5912 or 954-771-2050).

Review by Haskell Moore, kb5wix@aol.com

The MFJ-418 Pocket Morse Code Tutor

Techtoyz Micro RF Detector

Review by Haskell Moore, kb5wix@aol.com

May 1998 MONITORING TIMES 85
Radio Shack PRO-2050 Trunk Tracking Scanner

The 300 channel Pro-2050 is Radio Shack’s first base scanner which can selectively follow conversations in 800 MHz Motorola trunked radio systems. Uniden manufactures the PRO-2050 in Philippines for Radio Shack.

Feature-for-feature, the PRO-2050 is comparable to the portable Uniden BC235XLT Trunktracker, but has slightly less frequency coverage (see measurements table) and more powerful audio output.

As in the PRO-26 and PRO-67, the designers censored frequencies adjacent to the cellular phone bands so our PRO-2050 will not receive 823.9625 MHz. This frequency is licensed to local and state governments in Illinois, New Jersey, Texas, and other states.

Conventional Features

The PRO-2050 operates “like a Bearcat” and lacks the Program key and Monitor memories of other Radio Shack models. You program a conventional frequency by merely pressing the frequency digits then the Enter key. AM and NFM modes are factory set and not selectable. Its 300 channels are distributed among 10 banks and a 2 second rescan delay may be programmed on a per channel basis. A query feature identifies duplicate memory channels.

Various combinations of banks may be scanned and our PRO-2050 scans a mixture of frequencies at 78 channels/sec., skipping over empty channels. Individual channels can be locked out from memory scanning, and a simple keystroke sequence unlocks all nonempty channels in all banks.

One channel per bank can be designated a priority channel and sampled every 2 seconds. A single pair of frequency limits can be programmed for searching up or down, but searching and priority cannot be used simultaneously. Up to 50 frequencies may be locked out from a limit search versus 20 frequencies in the BC235XLT.

A single pair of limits may be programmed for a limit search. There is no Direct key or direct search facility, as found in GRE-made models. Factory preprogrammed frequencies for police, fire/emergency, commercial air, public service, and weather can be scanned by pressing the SVC key.

Oddly, Radio Shack replaced the excellent marine service bank found in Uniden models with a “public safety” bank of 140 preprogrammed frequencies in the 800 MHz band. Many of them carried data transmissions in my area. Up to 20 frequencies can be skipped during a service scan, except weather frequencies.

Data Skip jumps over unmodulated and constant tone or data signals if they are strong enough. It is disabled when scanning AM aircraft or using priority scan.

Trunk Tracking

The PRO-2050 is designed to follow conversations in Motorola Type I, Type II, and Hybrid 800 MHz analog trunk systems. It will not track GE (Ericsson), E. F. Johnson, 400 MHz, or 900 MHz trunked systems, which must be scanned in the conventional mode. The PRO-2050 defaults to Motorola Type II systems, which divide a large number of users into several groups called talk groups. We programmed three public safety Type II trunked systems by entering their frequencies using the same procedure as a BC895XLT and BC235XLT.

The PRO-2050 skips over telephone calls and conversations on talk groups designated as private.

Each of the PRO-2050’s 10 banks can be programmed with the frequencies for a single trunked system or with frequencies for conventional use, but you cannot follow trunked conversations and scan conventional systems at the same time. A Trunk key selects between trunking and conventional operation.

Talk group and fleet numbers, not frequencies, are displayed while searching or scanning in the trunked domain. Fortunately, Uniden designed the PRO-2050’s rescan delay, hold, and lockout facilities so operation is very similar in both trunk and conventional domains, like the other TrunkTracker models.

You can search or scan for active talk groups in the trunked domain and lock out up to 100 uninteresting talk groups. You can program up to five lists per bank with talk group numbers for scanning. Each list can hold up to 10 group IDs, though there’s no warning of duplicate group numbers. See March 1997 MT for a more detailed description of the trunk tracking features in the BC235XLT, which work the same way.

Usability and Performance

The LCD display is easy to read and brilliantly backlit by an incandescent bulb through an orange filter. The lighting scheme is simple yet effective — the same as in the PRO-2040. We prefer it to the PRO-2006-type electroluminescent panel which wears out with use and is expensive to replace.

The volume and squelch knobs are too close together and it’s difficult to adjust one knob without a finger bumping into the other knob. The rubber keypad has a good feel and a keypress confirmation beep can be enabled or disabled via a power on procedure. The tiny keytop lettering of the center keys has us squinting. The Manual key is perhaps the most important key in any scanner, but it is small and the same color and shape as most other keys on PRO-2050’s central dashboard.
The PRO-2050 is lightweight because there is no chassis and the case is entirely plastic. Power is furnished by an included 12 VDC wall wart. Components are surface mounted on a main printed circuit board and a second board located behind the front panel. We connected a CTCSS display to the discriminator using the solder pad shown here, though this may void the warranty.

The triple conversion PRO-2050 employs IFs (intermediate frequencies) near 380.7, 10.85 and 0.450 MHz and the image rejection on our test unit is excellent at the frequency we measured. Our PRO-2050 reception is starkly “cleaner” than most of the other middle priced scanners we tested. It isn’t plagued by intermod or image problems in the 160 MHz railroad band nor most of the spectrum while using an outdoor antenna.

We find relatively few birdies in our PRO-2050. Harmonics of the crystal controlled 10.4 MHz local oscillator are responsible for birdies at 31.2, 41.6, and 52 MHz, though they are weaker than the same birdies in our BC235XLT.

Audio output is crisp. Monaural headphones or an external speaker can be connected through a 1/8” jack on the front panel, but there is no Tape output jack.

### Finale

Though its front panel could be better, our PRO-2050’s reception is excellent. The PRO-2050 is a fine match for the person who wants “meat and potatoes” trunk tracking and conventional scanning without frills or a lot of intermod.

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**MEASUREMENTS**

**Radio Shack PRO-2050**

Scanner 5/N 75004170

<table>
<thead>
<tr>
<th>Frequency coverage (MHz)</th>
<th>29 - 54 (5 kHz steps)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>108 - 136.975 (AM, 12.5 kHz steps)</td>
</tr>
<tr>
<td></td>
<td>137 - 174 (3 kHz steps)</td>
</tr>
<tr>
<td></td>
<td>406 - 512 (12.5 kHz steps)</td>
</tr>
<tr>
<td></td>
<td>806 - 823.9375, 851 - 868.9875, 896.1125 - 956 (12.5 kHz steps)</td>
</tr>
</tbody>
</table>

FM modulation acceptance: 14 kHz

Image rejection due to 1st IF: 65 dB at 155 MHz

Audio output power, measured at headphone jack: 0.86 W @ 10% distortion

Practical memory scan speed: 78 channels/sec.

Search speed, Turbo: 267 steps/sec.

Search speed, regular: 97 steps/sec.

Intermediate Frequencies: 380.7 (approx), 10.85, and 0.450 MHz

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To find other radio hobbyists, consult [http://www.grove-ent.com](http://www.grove-ent.com) for a listing of radio clubs and nets worldwide, or send an SASE for free list (NA only) to Club Circuit, PO Box 98, Brasstown, NC 28902. No local club? Join a managed email list (see p. 2) for your area of interest.

For hamfests in your area, visit [http://www.arrl.org/hamfests.html](http://www.arrl.org/hamfests.html) or call the ARRL at 860-594-0200.
Drake's R8B: Is It Really the Best?—Part I

With the Drake R7 and R8, the first production units had problems that were corrected in subsequent manufacturing runs. So, with the R8B we decided to let Drake go through a number of production cycles so they could make any circuit adjustments that might be appropriate. As it turns out, our concern was unnecessary—Drake tells us that no “debugging” has been needed.

So, here is the first of two columns on our latest findings with this, the most popular tabletop shortwave receiver on earth. We’ve especially compared it with older Drake models to see whether it is, in fact, the hottest thing ever to emerge from Drake’s laboratories.

**Clobbers pre-1979 Drake models**

To clear the deck, the R8B runs circles around virtually any Drake receiver made before 1979, such as the R-4 series. SSR-1, SW-4A and SPR-4. (We can’t compare it to the DSR/MSR series, as we’ve never tested them.) To a lesser extent, it is a genuine step forward over the original R8 and R8A, as well as the current SW8.

This leaves only the ca. 1979-1985 Drake R7, R7A, R77 and R4245—the immediate predecessors of the R8 series—as serious contenders. The popular R7 and R7A are virtually identical, whereas the relatively rare R4245 (the R77 reportedly is identical) differs in performance from the R7/R7A only because it has a more stable tuning system. So we’ll just refer to these models collectively as “R7” except where tuning stability is concerned.

**Inboard multi-voltage power supply**

The R8B tabletop communications receiver is virtually the same as the R8A, but with better selectable-sideband synchronous detection, more (1000) memory presets and faster scanning. It uses an inboard power supply, an improvement over some other tabletop models which, alas, use “wall-wart” AC adaptors. The R8B works off 90-110, 108-132, 180-220 and 216-264 VAC, 50-60 Hz, as well as from 11-16 VDC through a connector on the rear panel. The necessary separate fuses for AC and DC are both inboard, a nice touch.

However, to run the R8B from 180-264 VAC requires that a resistor first be removed from the bowels of the receiver—a task Drake recommends be done by a trained service technician. Presumably drawn from 180-264 VAC to 90-132 VAC requires reinstallation of that resistor. Whatever, it is an amateurish and peculiar procedure unworthy of Drake.

The R7’s inboard power supply covers the same voltages, but doesn’t require anything other than the flipping a couple of switches. Score one for the R7. However, the R7 requires an inline outboard fuse when powered by DC, so...

**Excellent tuning system and display**

The R8B comes with all manner of well-thought-out tuning and scanning features. These include two VFOs; those (count ’em!) 1000 memory presets, which store just about every receiver operating parameter and also allow station name to be displayed; keypad and multi-speed knob tuning; up/down slewing in 100 kHz increments; all-mode squelch; and a variety of sophisticated scanning options. The R7 has nothing but a humble single-speed tuning knob, and in fact is one of the clunkiest receivers ever designed for “getting there from here.” If you’re into frequency hopping, there’s no contest: the R8B gets an “A,” the R7 a “D minus.”

The R8B’s tuning is, of course, fully synthesized. It tunes and displays in 10 Hz increments, and our tests show the frequency readout to be accurate to within 20 Hz. There is virtually no chugging, and stability is to within 40 Hz from startup. Unlike the original R8, the R8B can display frequency in kilohertz, including with the appropriate decimals, or megahertz if you so choose.

The R7, on the other hand, is tuned by a non-synthesized electromechanical PTO that can drift a whole kilohertz—1,000 Hz—from startup (the quasi-synthesized R4245 can drift up to 200 Hz). And the R7’s frequency display is only in 100 Hz increments. So here, too, it’s the R8B—no contest.

**Features, features, features**

The R8B and R7 both have two selectable antenna inputs. However, unlike the R8B, the R7 also has a converter port which acts as a deep-isolation third antenna input. Additionally, the R7 comes with an inboard splitter which allows either antenna #1 or antenna #2 to serve two receivers at the same time with negligible signal loss. On the other hand, the R8B handles both low- and high-impedance antennas, whereas the R7, in principle more than in practice, requires an outboard balun for high-impedance antennas to work at optimum efficiency. Here, it would appear to be a coin toss between the R8B and the R7, but in practice those with two receivers will almost certainly prefer the R7’s setup.

For decades, Drake has been famous for its unsurpassed passband tuning circuits, which they now call passband offset (PBO). The R8B continues in this tradition, putting to shame comparable circuits in Japan Radio and other competing gear. Nevertheless, the tuning range of the R8B’s PBO is greater than can be sensibly utilized, even on mediumwave. This wide tuning sweep makes it much fussier to tune than that of the R7, whose PBO is as close to perfect as you’re going to get this side of the pearly gates. Here, give the R8B an “A minus”... an “A plus” for the R7.

Also included in the R8B are a tunable audio (AF) notch filter, a two-width noise blanker, two 24-hour clocks, a timer, an attenuator, a switchable shortwave preamplifier, an accurate analog signal-strength meter, a front-panel-display dimmer, plus an RF gain control. The large LCD indicates the status of just about every receiver variable. To tilt the receiver to a com-
fortable angle for operation, the R8B comes with a flip-down elevation rod that’s Gibraltar sturdy, but a fingernail-breaker to pull down.

The tunable AF notch filter works quite well, being deep, as in earlier versions, and to our pleasant surprise it is no longer difficult to tune. However, it won’t kill hets of less than 500 Hz, which especially in the tropical bands can be a disappointment. The tunable IF notch filter on the R7 knocks out hets of a bit less than 500 Hz, but not so much, that the R8B’s 50 kHz IF won’t readily interface with everyday 455/450 kHz devices, anyway.

Next month, the conclusion of the fascinating R8B story!

**Japan Radio NRD-545 in the wings.**

Although the forthcoming fully-synthesized Japan Radio NRD-545 receiver has not yet been officially released here, it should be on dealers’ shelves about the time you read this. Its street price in Japan is 178,000 yen, or about $1,400.

Japan Radio apparently has been passing out early samples to selected individuals and organizations. We are not among these, and past experience has shown that there is almost invariably a good reason why a manufacturer wishes to keep our traditionally grouchy review from making early impressions. The disappointing Japan Radio NRD-345 was just such a model, but of course we can’t know how the ‘545 will fare until we actually put it through our full laboratory and hands-on paces.

Although comments circulating to date are predictable—“the best receiver ever” and such—there are signs that the flaws which one of Passport to World Band Radio’s review team noted at an exhibition in Tokyo last year may not have been corrected. Even one of JRC’s “optimistic” reviewers is now indicating that the synthesized audio sounds robotic and un-lifelike.

We’ll see. As always, we will get our mitts on this receiver when it goes on sale to the public, then after running it through our chamber of horrors we’ll lay out our findings in this column.

This equipment review is performed independently by Lawrence Magne and his colleagues in accordance with the policies and procedures of International Broadcasting Services, Ltd. It is completely independent of the policies and procedures of Grove Enterprises, Inc., its advertisers and affiliated organizations.

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**Sophisticated clocks and timers**

The R8B’s two 24-hour digital clocks display seconds separately, a boon for DXers waiting for station IDs at the hour. (Why is it that not a single shortwave receiver with two clocks allows one to be in 12-hour “AM/PM” format for local time, the way normal people are used to it? At least the inexpensive MFJ-108B dual-time accessory clock gets it right.)

The clocks are easy to set, and come with 30-minute power backup. However, the clock display is shared with the frequency readout, even though Drake has cleverly designed this to be as painless as possible. On our receiver, the clock usually accurate to within better than a few seconds.

The R7’s clock? Simple: there isn’t one, much less two. Instead, I use a 1969 Tymeter 24-hour mechanical-digital desk clock with a synchronous motor. It is absolutely accurate day after day, week after week, so long as the electricity doesn’t fail.

The R8B’s clocks second as a pair of on-
How Suite It Is!
A Look at WiNRADiO’s Digital Suite Product

If you have been following us the last few months you’ll remember that we have been visiting the world of PC based receivers. We started with ICOM’s new IC-PCR1000 and then went back to take another look at Rosetta Lab’s WiNRADiO 1000i. Since the WiNRADiO’s first review years ago by a major communications publication (that’s us!), the software has gone through a number of major changes. To the company’s credit, all updates have been available free-of-charge to WiNRADiO Customers via their Web Site (http://www.winradio.com).

About 16 months ago we looked at Rosetta Labs’ first add-on program for the WiNRADiO WinDatabase. This time we’ll try Rosetta Labs Digital Suite, which is a dedicated add-on to WiNRADiO to provide decoding of digital signals and more. What modes does it decode? Is it equally useful across the wide frequency spectrum of the WiNRADiO receivers? What hardware/software does it require? How well does it do its job? Can it mix me a martini? Hold on! Let’s take the questions one at a time.

**Sophisticated Computer Requirements**

In my estimation WiNRADiO 1000i is a great product. Its performance and price are hard to beat. But, for me, another feature that sold me on WiNRADiO 1000i is its very modest computer requirement. It runs great on a ham-show-bargain 486-66DX2 computer, with just 8 MEG of RAM and Windows 3.1. We even had it running in DOS mode on a Compaq 286. The simple, inexpensive computer requirements just add to the versatility of WiNRADiO’s concept. But now — enter Digital Suite!

I opened the Digital Suite manual and read that the recommended computer was a Pentium 133 or higher with a sound card, and it would only run under Windows 95! I was disappointed. A quick check of WiNRADiO’s website showed that these requirements were, indeed, clearly stated. I guess I looked right passed them, assuming the simpler WiNRADiO 1000i requirements. Even the absolute minimum requirements list a Pentium 100MHz, sound card and Win 95. Humph. Well, get a cup of coffee and I’ll move WiNRADiO into a Pentium 166 MMX machine running Win 95.

...OK, I’m back. Installing Digital Suite was a snap. Within a few minutes the software was loaded. Prior to turning the computer on, the single connection from the sound card line input to WiNRADiO audio output was made via the included cable. When WiNRADiO’s software is started a new command line will appear in the Main Menu — Digital Suite. This is how all functions of Digital Suite are accessed. And, as with all decoding packages, setting the audio input level is a key factor to successful operation.

**Leveling the “Playing” Field**

Using Win 95’s Volume/Recording Controls (accessed from the Programs/Accessories/Multimedia menu), Line-In is enabled and its volume is set to near maximum. Now the Audio Scope/Spectrum Analyzer function of Digital Suite is required. This is similar to a software product that we reviewed many years ago. I think it was called Pro Audio Spectrum Analyzer. It was one of the first useful PC instrumentation applications. Digital Suite’s Scope can also be used as a stand-alone instrument.

Using an off-air signal, the volume control on the WiNRADiO panel is now adjusted. The WiNRADiO’s volume is increased until the “clipping light,” on the Audio Scope just begins to flash. I found that setting it a bit lower, so that no indication was observed, gave the best results. However, the best setting will be a function of your specific system and sound card. Remember to use the Windows Volume Control to set the speaker volume, not WiNRADiO’s volume as you normally would.

**What Can It Do?**

With that level setting procedure behind us, let’s look at the modes that Digital Suite can decode. There are eight featured items listed in the manual, but only three are actual “message” modes. These are FAX, ACARS and Packet.

The FAX mode supports decoding from HF sources and directly from satellite in the
Operation of the FAX mode was quite easy but required greater attention to input level setting. Using a longwire and a bit of patience, clear, clean maps were copied. FAX signals on HF are not as common as they were just a year ago.

In many ways Digital Suite’s FAX mode reminded me of Software Systems Consulting’s FAX products, which I rate as one of the best in the add-on market. There are lots of options and user-controlled parameters which make this FAX decoder very versatile, yet easy to use.

Swing Low, Suite Chariot

Moving to the VHF aircraft band, WiNRADiO was tuned to 130.025 MHz. ACARS is a digital mode, similar to Packet, which the airlines use for position, aircraft status, weather reporting and special passenger requests. You never know exactly what you’ll read on ACARS!

Digital Suite copied ACARS as well as any program I have used. Weak signals, from aircraft over 100 miles away and descending to approach altitudes, still resulted in pretty clean copy. The ACARS screen is presented in a nice, simple, yet comprehensive manner. See Figure 2.

Still Higher to 2 Meters

Hams use packet on both HF and VHF. HF conditions were quite poor from my location when I ran Digital Suite. Therefore I decoded two meter (144 MHz) Packet signals. Capture of newly tuned Packet signals was quite quick with very little noticeable loss of copy. Screen scrolling was very fast. The ability to look at Packet signals with the scope is very interesting. You can almost tell which Packet station you are tuned to from its “signal print.” To summarize: the Packet decoder works as well as any I’ve used.

It That All There Is?

So far we have covered four of the eight functions of Digital Suite (counting the scope function). Yes, I know, “It’s not really a decode mode.” Well, neither are the next two functions: CTCSS and DTMF. These are audio tone decoders and are very useful when monitoring VHF/UHF remotes and repeaters which can be accessed via tones. But they are not digital message decode modes.

Another function of Digital Suite is its squelch controlled recorder. When the squelch is “broken” by a signal the Recorder feature is enabled. The resulting audio is recorded in a *.wav file. Very useful in a scanner environment. Well, that still leaves only three decode modes. Is that all there is?

No. Life is suite-r than that. First of all, advertising suggests that more modes are to come and, per the company’s practice so far, these will be made available free of charge online to Digital Suite owners. Secondly, to my mind, Digital Suite, is a misleading title which detracts from the truly unique and powerful concept the program introduces: scanning based on signal analysis and classification.

We all know that some scanners can tell the difference between data and voice. But these are very crude methods based on how fast a resistor/capacitor network charges. Digital Suite uses the power of its Spectrum Analyzer (and I suspect, correspondingly fast hardware) to analyze and compare the spectral components of the signal. It knows the modulation content of the monitored signal.

Life Without Squelch - Almost

As the manual says, “... it is possible to implement ‘intelligent scanning’ ...” The user can select which class of signal should be bypassed. See Figure 3. This is the first time I have ever seen this implemented in a nondedicated surveillance receiver. For the first attempt it works quite well, and it is very useful in its present form in the VHF/UHF range.

The choices are limited to silent channel, noise, data, and “other,” including voice. Although not completely unnoticeable, the excluded signals were smoothly passed over. Think of the future scanner receiver: No more squelch circuits which remove weak, but desired, signals along with the noise; voice print access replacing tone access... The possibilities surpass science fiction.

Suite Final Analysis

Real nice product, regardless of the name. In its present form Digital Suite is not an extensive suite of digital signal decoders as the title implies. If that is what you are looking for you would do better with other programs, including freeware/shareware products.

But, if you are looking for a program which will make using your WiNRADiO a great scanner, with powerful advanced features, then look to Digital Suite, or should I say Digital Scanner Sweet. It’s available for $99.95 USD (plus $15 shipping to the USA or $5.50 if you order from Grove). Check www.winradio.com or www.grove-ent.com.

Listening Post

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May 1998 MONITORING TIMES 91
LETTERS TO THE EDITOR
NEWS AND VIEWS FROM OUR READERS
Rachel Baughn, Editor

Nigerian Scam?

Sue Wilden of Columbus, Indiana, sends a cautionary note about a scam ring based in Indianapolis asking for investors in “excess” oil profits in Nigeria.

“Letters are being sent to various businesses in the state and they are being signed by Tude Davies, Tome Adah, Peter Zik, Alivo Fawaz, Taribo Jaja, Degba Udeh, Godwin Uzoka and Dabo Jubril. Anyone who receives such a letter is asked to immediately contact the United States Secret Service.

“I am sending this because Voice of Free Nigeria is using an Indianapolis address for QSL requests and this may be a front for the scammers. Those who QSL this station need to be careful.”

Uniden BC780XLT—No such thing?

“Contrary to a statement by me [and also Rich Barnett] based upon a news release from the Consumer Electronics Show (CES), Uniden officially denies that there is a product under development called a BC780XLT, nor any other number since the BC895XLT.

“While new product discussions are always topical with the company, they assert nothing matching the description is under development at this time.”

—Bob Grove

PCR-1000: A discussion of methodology

Dave White of Hermitage, TN, wrote John Catalano asking for some clarification on his review of the ICOM PCR-1000 in the March issue of MT. Following is an “email round robin” between Dave, John, and Bob Grove:

“1.) Is this unit designed, or marketed, as a portable?...Is this really the way the typical potential user of the device is going to use it?

“2.) John seems surprised to find that ‘the signals above 108 MHz were nowhere to be found using the HF tuned dipole.’ I’m at a loss to understand why a receiver’s inability to receive signals in one frequency range with an antenna designed for another can be considered the fault of the receiver.

“3.) After much globe hopping, antenna experimentation and side-by-side comparison, John finally concludes that the IC-PCR1000 works better with an external antenna designed for the frequencies one wishes to monitor than with the supplied ‘whip’ antenna. —The same

can be said of every receiver I’ve ever owned or used. Like the performance of an HF antenna at VHF/UHF frequencies, the underlying cause can be traced to the laws of physics as they apply to electromagnetic radiation.”

“Dr. John’s” response:

“1.) First Dave, let me say that I had lots of mail about the IC-PCR1000 before I wrote the article. The major questions asked were: How does it compare to other wide spectrum radios (i.e., WinRadio 1000?) How does it compare to standard communications radios like the R-71? How easy is it to use? Can I throw it in my suitcase and use it with my laptop on business trips? [In retrospect] it might have been helpful to have mentioned the fourth item in the article. The travel aspect did seem to dominate.

“2.) On your question concerning the ‘tuned antenna’ and physics, I’m sure you’ll remember that inducing a dipole moment into a conductor does not require tuning. Of course the transfer of energy is greatest when the conductor is resonant to the radiation. But this is not a necessity.

“Also, remembering those tried and true engineering formulas, you will find that there is no such thing as a single frequency tuned element. Every tuned conductor can resonate at multiples of the wavelength. The wave number X of the antenna (i.e., wavelength times X) has a great effect on the bandwidth of the resulting conductor at a given frequency. But as long as it is an integral number of wavelengths the dipole moment will be transferred with minimum loss.

“I don’t use a discone because of its ‘unity gain’ characteristic, but it strikes me that its element lengths are more conducive to fairly broad VHF/UHF coverage than is the HF dipole. Seems like using the HF tuned dipole over a wide range of HF frequencies would be a fairer (and more realistic) test of the receiver. Stated another way, using the HF dipole on VHF/UHF would probably yield about the same results as would the discone on HF.

“The point is, the operation I reported was a result of the wide range, untuned input stages. By necessity, the front end gain has to be designed low if expensive banks of tuned stages are not used. High, untuned gain stages, in a wide spectrum radio, results in high sensitivity. But it is unusable due to mixing products with cause QRM everywhere.

“3.) The bottom line performance obviously had to do with design tradeoffs rather than testing methodology — that point came through ‘loud and clear!’”

Bob Grove adds:

“Good dialogue. But there are two more issues in defense of Dave’s postulates:

“(1) High SWR from using the HF dipole at VHF and UHF will result in significant line losses, especially at the higher frequencies and with long coax leads.

“(2) Directivity at VHF/UHF with an HF dipole favors the ends of the wire, and radiates up and down as well, plus it is horizontally polarized in a vertically-polarized in a vertically-polarized VHF/UHF environment. All of these will produce consequential reductions in reception.”

Indiana Public Law 35-44-3-12

From Lawrence Estep of New Albany, Indiana, we print excerpts from his excellent letter to new Indiana State Senator, Connie Sipes. Lawrence told Bob Grove, “I am continuing my efforts to see our unfair Indiana statute overturned. I am sure you remember my case in 1991, as I was the subject of your September editorial that year. I am still gainfully employed in the local media, full-time now, but continue to see harassment of myself and others based on the misunderstanding of this travesty of a law.”

Mrs. Sipes,

I am writing you today regarding Indiana Public Law 35-44-3-12, which concerns use of radios capable of receiving police frequencies...I had the pleasure of being a student at New Albany High School, and was actively involved in the Radio and TV program there.

I continued to pursue this field after high school, and presently work for WDRB/WFTE in Louisville. I was a freelance videographer for our local Louisville area media outlets starting in 1990, and I became very familiar with local fire department officials, and even assisted with filming several events for them.

I have also been an active weather spotter with the National Weather Service for nearly a decade, and my observations have assisted in issuing severe weather warnings for several Indiana counties during that time.

On July 25th, 1991, while pursuing freelance media activities, I was arrested, handcuffed, and taken to the Floyd County jail for violation of Indiana law 35-44-3-12, Unlawful Use Of A Police Radio. I had a police scanner in my vehicle, programmed with local fire, police, media, and weather service/weather spotter frequencies. This radio was not used for any
criminal purposes, but was used to assist me in
my freelance videography and storm spotting.

Needless to say, I was subjected to severe humiliation, and treated like a criminal by local authorities, including being interrogated regarding my personal activities, ... and forfeiting my scanner... After explaining my situation to the local prosecutor, all charges were dropped. I was also thanked for my public service that I had performed before my arrest with the help of my scanner, including the severe weather spotting, and reporting several drunk drivers to police via CB radio as a member of REACT, a local volunteer group...

My concerns with the law, in its present unclear form, is that other law-abiding citizens may be harassed, arrested, and humiliated for providing a public service to their community, all because they simply possess a police scanner... If the law is loosely interpreted, even a citizen working with a neighborhood watch patrol walking or driving down their own street could be breaking the law. Severe weather spotters in mobile vehicles, monitoring local law enforcement, ham radio, and weather service reports, are definitely breaking the law.

[Lawrence wisely outlines what he considers reasonable restrictions on scanners, omitted for space constraints.]

I believe that the incidents of police scanners being used for criminal activities is far less than the incidents of such radios being used for the good of the community by law-abiding citizens such as myself. Bob Grove, author of Monitoring Times magazine, summarized this point best by saying, "Neighborhood patrols, crime watch teams, REACT chapters, and other scanner listeners—often in their cars—commonly provide critical information to public safety agencies of road hazards, accidents, locations of crime scenes and suspects, fires, and severe storms about which they hear over police broadcasts."

I believe that these issues were not considered by the authors of this statute, and that they only considered the criminal element in their decision-making. I hope you will continue the pledge of Senator Kathy Smith to look into this issue, and try and change this outdated and needlessly prohibitive law.

Strike three, I'm outta here

Bob Homuth, KB7AOD, responded to recent comments in MT about promoting radio hobbies in the newspapers and TV/radio news. Bob says, when he tried, these were the responses he got:

"The first reporter, recently retired from a large newspaper and teaching my college newswriting class assured me that individuals should never have scanners or shortwave radios. It takes special skills to decipher the coded broadcasts — skills that only those on a major newsgathering staff can decode.

"I'm not with the police. I'm not a firefighter or rescue worker. I'm not even with the newspaper. To him — I do NOT need a scanner. Besides, I might spread panic if I tell anyone what really happens behind the scenes. (I bought two more scanners and a shortwave radio soon after!)

"The second reporter, a TV/Radio columnist, laughed out loud when I told him that the local ham club relays the Space Shuttle STS mission audio on 440 MHz repeaters. He wrote a column saying that 'Bob hears 'little green men' on his scanner....'

"Strike two..."

"Once more... A local TV news station advertised their number for hot news tips. Norb answered my call, and wondered what the local mall security channels were? I sent him a 200-frequency list of local UHF activity. He never called me back.

"Some months later, he did call back. A local self-styled militia got arrested for allegedly planning to destroy government buildings in Phoenix. Norb called me with the accusation, '...since you have ham radio types work within these terrorist organizations all the time, tell me about your 'inside knowledge'?

"I refused to even answer that insult. He then asked if any special stuff was going on at our local zoo.

"I replied, 'Gee, Norb. They have lots of animals....' End of conversation.

"How are hams expected to promote the hobby under such confrontational and stereotyped opposition? You can't get anthrax from a scanner, and a 70cm beam won't blow up buildings!

"I have not received a single complaint from Phoenix police, sheriff's officers, mall security, park rangers, or anyone else with authority and half a brain. What makes these reporters... get apoplectic over Bob listening to weather reports, the Space Shuttle, and local businesses?"

Dear Monitoring Times,

Just want to thank you for the fun I have every month reading your magazine. Over the years I have enjoyed my Ham ticket more by reading MT, and have become active in other aspects of the radio hobby. I really have learned a great deal by reading MT, thank you so much for such an entertaining, educational publication.

—Jim Mooney KB5QAC, Albuquerque, NM
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Taking Credit Where Credit isn’t Due...Again

I don’t ordinarily indulge in “League bashing”—there are plenty of others out there already doing that. But a recent membership solicitation from David Sumner, K1ZZ, Executive Vice President of the American Radio Relay League (ARRL), was just too much to ignore.

Sumner lists several ostensible examples of how the League helps hams. One imaginative example describes their initial response to last year’s initially-proposed anti-scanner legislation: “The ARRL spotted this legislative Trojan horse immediately and intervened successfully to alter the bill in our favor.”

Fact: When MT’s assistant editor, Larry Van Horn, contacted the League’s own legislative representative, Steve Mansfield, to alert him to the impending disaster, Mansfield shrugged the matter off, reflecting the League’s traditional response: It’s the scanner folk’s problem.

It wasn’t until MT had allied with more perceptive members of the communications profession, and had already mustered active opposition to the impending Bill, that the League realized that the hams would also be affected. Along with other representatives of the radio industry, they met with the Congressional staff and did help influence the outcome.

But their too-little, too-late, response has been costly to the hams. The FCC is preparing to decertify amateur radio equipment that can be altered for extended frequency coverage. Understandably, the League hasn’t taken credit for that.

Such inertia and historical revisionism is reminiscent of earlier ARRL press releases, such as the one patting themselves on the back for supporting no-code licensing. In fact, the League vigorously opposed the no-code movement, but decided to take credit for that, too, after it became clear that the FCC was about to authorize it.

If you don’t remember this, ask one of the League’s old timers (and there are plenty of those) if he still has one of the offensive buttons worn by ARRL representatives at hamfests which said, “Stop Bitching. Learn the Code!” I’m sure this confrontational attitude toward newcomers really helped build League membership.

* Listeners’ Advocacy

MT is often asked to start a listeners’ advocacy movement to protect the rights of radio enthusiasts who are at the mercy of ill-advised, repressive legislation, such as that which we nearly experienced and successfully opposed last year. Had it not been for the concerted effort of thousands of irate radio hobbyists, hams, engineers, and manufacturers, Markay’s original HR1984 and Tauzin’s HR2369 bills, as choreographed with the cellular lobby, would have effectively shut down the scanner industry and deprived scanner listeners their legitimate access to the airwaves.

But would listening hobbyists rally to support such an umbrella organization the way a sizable number of hams support the ARRL? The Association of North American Radio Clubs (ANARC) attempted to mediate the needs of shortwave and scanner clubs for many years, even sponsoring annual conventions around the U.S. and in Canada, but never grew to an impressive membership. ANARC still exists, has their weekly ham radio net, and helps correlate member-club activities, but meets quietly at the SWL Winterfest in Kulpsville, Pennsylvania.

Probably the main difference between radio amateurs and SWL/scanners is that the hams have more of a fraternity, a history. They go back to the earliest days of radio, have invented countless electronic technologies and products, have a common licensing requirement, are tested to prove their skill levels, and provide emergency communications during disasters. And perhaps most important, they use their common interest to communicate with one another over the airwaves, breaking down cultural and social barriers, exchanging information.

Hobby listeners have no such common ground; they buy their radios from Wal-Mart, Radio Shack, or some catalog discounter (and, hopefully, MT advertisers!), and sit back, passively listening without intercommunicating. They don’t have to show their mettle to anyone. Thus, they are largely uninspired to become involved in movements since they don’t feel they are part of a group and, therefore, have no larger loyalties.

There are approximately 600,000 hams, and some 171,000 of them belong to the ARRL and receive QST magazine. There are more than ten million scanner listeners, but the combined subscriptions to MT and PopCom are only in the tens of thousands. Who could do the work, and how would they be paid?

Our listening hobby, as enjoyable as it is, will remain secondary to other, more pressing activities. Future conflicts will arise, and motivated members will take action. But a concerted lobby is unlikely. Fortunately, the immediate alert capabilities of the Internet are on our side. For the first time, this exquisite tool of technology saved us from being swept under the rug by powerful special interests. It will do it again.
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