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MONITORING TIMES

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Knoxville Hosts the MT Convention

Sneak Peek: A New Stealth Aircraft

HCJB Celebrates Its Beginnings

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November 1991

MONITORING TIMES

Call to Immediate Action

Without your help, Congress may ban 800 MHz scanners and establish a precedent dangerous to the entire monitoring community. See pages **4** and **112** for action you can do today.

Baltic Voices of Independence

by Charles Brian Goslow **8**

Faithful to the desires of the Baltic people, Radio Latvia and Radio Vilnius have persevered in reporting independent regional news in spite of considerable persecution. However, just days after this first-hand visit by Charles Goslow, the Soviet coup cast their futures into doubt.

Travel with Goslow through the Baltic countryside and meet the people behind these courageous broadcasters as they begin to explore real independence.

Sneak Peak at a New Stealth Aircraft

by Steve Douglass **14**

There are more secrets in the Nevada desert than just the F-117A Night Hawk or the SR-71 Blackbird, mysterious though they may seem. Rumors of "Aurora" and "F-19" stealth aircraft are now joined by a new one: the TR-3A "Black Manta" reconnaissance plane. Did the TR-3A provide real-time imagery for the F-117A attack aircraft in Iraq? Now that the secret has been "leaked," perhaps some answers will be forthcoming.

HCJB: A Celebration of Beginnings

by Ken MacHarg **18**

Several important anniversaries are being celebrated this year by HCJB, the powerhouse religious broadcaster in Ecuador. Many DXers' first QSL card came from HCJB.

COVER PHOTO: Knoxville Enhanced 911 Communication Center; photo by Harry Baughn.

Northern Patrol

by Everett Slosman **22**

The U.S. Border Patrol: the hot sands of the U.S./Mexico border yields the hottest action, but the vast expanse of the northern border can be just as intimidating. You must be under age 35 to apply, but anyone with a radio and some patience can monitor as the patrol tries to stem the flow of guns, drugs, black market goods and illegal aliens.

MT Convention: Wish You Were There **26**

A few highlights from the October convention in pictures and words.

And More ...

Traffic control is just as important to human safety on the waterways as it is in the air, especially in a busy harbor. If you are within listening distance of VHF traffic, you'll find Vessel Traffic Services or Vessel Traffic Management contain both humor and tragedy. Jim Hay gives you the frequencies to punch in on page 48.

Taking a deep breath, Karl Zuk plunges into the deep waters of DAB (digital audio broadcasting), the brash new technology that claims it's going to take over the airwaves (p. 50.) Karl makes it sound simple, but if you're still confused, we'll be talking about it further in the next few months.

And speaking of reducing complexity to the simplistic, Uncle Skip will tell you the adventures of Mr. R.F., after which you should be able to trouble-shoot your receiver problems like a pro (p. 44). Just be sure you never try Skip's explanation on another novice; they'll slap you into a straight-jacket for sure.

For more on the technical side, you can learn how to wind coils, build an off-center-fed dipole for scanning, adapt an old-fashioned cage antenna for your use, or learn the relative merits of the pocket-sized ICOM R-1. It's all here and more in our expanded 112 pages!

DEPARTMENTS

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LETTERS

Best one yet! After only two *MT* conventions, that's to be expected, perhaps, but everyone who convened in Knoxville, Tennessee, on the first weekend in October, did their part to make it a memorable event. We had great publicity from other publications, clubs, exhibitors, and loyal fans.

It was gratifying to see radio hobbyists of all flavors participating as one family. Now, more than ever, we must cooperate with each other if we are to guarantee the public's access to information on any wavelength.

For more facts, figures, and photos on the 1991 Monitoring Times Convention, there's a report on page 26.

The wealth of knowledge embodied in the *MT* readership never fails to astound even our resident "experts." Case in point: In September's letters to the editor, a puzzle was presented as to the identity of an unidentified government terminal at McCarran International Airport outside Las Vegas. No sooner was this published, than we received this month's article from Steve Douglass disclosing the existence of yet another secret stealth aircraft. It is his belief that the government airline is connected with this project.

But is it? We received four other speculations as well. To do justice to the fascinating research and experiences of our "MT detectives," we have forwarded their theories to Federal File editor Rod Pearson. Our thanks to Richard Ashley of Utah, Joseph Cejka of California, Harold Ericsson of California, and Chris Rolfe of Kent, England, for their contributions.

The growth of increasingly repressive legislation, such as H.R. 1674, is always uppermost on all our minds. Charles Bloss of Kansas said in a letter to his Congressman, "The original 1986 legislation [ECPA] was ridiculous enough, but this latest revision is just plain insanity."

That's putting it bluntly; too bad the legislators don't see it as clearly, or realize the full implications of what the House has already passed.

The state laws governing mobile scanner use are almost as unreasonable. Chuck Merchant of Illinois says, "I have been a scanner and shortwave monitor for over forty years. I have from time to time heard some comment about the legality of a scanner in a car. I recently heard of the arrest of someone on the Indiana Toll Road for having a police scanner in their car, but I was not aware of the seriousness of the problem 'til I read Bob's Closing Comments."

Clarence Marshall, South Carolina, is finding his way around the law. He says, "Next month I will test for my ham ticket; the sole reason is so I can use my scanners in my car without fear of arrest (except in New Jersey). I have no interest in transmitting or being active as a ham. Amateur radio is a great hobby but I prefer SWL and scanning public service frequencies."

Clarence says he resents having to "be licensed in order to exercise my Constitutional rights." It's not as though a ham license is going to make someone less likely to use a scanner illegally. But since his job requires him to travel a great deal, he feels compelled to apply for the license to avoid arrest.

In New Jersey, even the ham license does not exempt the motorist from the ban. We found more details in the *W5YI Report* on the event Clarence referred to. Eric Dobrowansky, KA2YKC, of Cranford, New Jersey, was arrested for having a two meter rig in his car capable of operating on police channels. Ironically, the police became aware of his equipment when he offered to help locate the source of police radio jamming.

Considering the legal hassles, one might be tempted to go back to Citizens'

(please turn to pg. 108)

COMMUNICATIONS

ONLY YOU CAN STOP THIS BAD LAW!

The U.S. Senate is about to vote on the 1992 FCC Funding Bill, a good piece of legislation—until it was compromised by Paragraph 9 (formerly Paragraph 8), sponsored by Matthew Rinaldo (R-NJ).

The Bill provides a 1992 budget for the FCC; it will probably pass quickly. But the Rinaldo Amendment serves the cellular monopoly, pretending to provide radiotelephone privacy while actually perpetuating the marketing ploy which began with the cellular-sponsored Electronic Communications Privacy Act (ECPA) of 1986.

The Rinaldo Amendment makes it illegal to manufacture or import any scanning radio that receives—or can be modified to receive—frequencies used for cellular transmissions.

This first step in radio censorship would set a very dangerous precedent. It would invite other licensees and agencies to demand equal protection, removing public access to a public resource, and invite abuse by removing the ability to hear and report unlawful use of the public's radio spectrum.

If the recreational scanner hobbyist does not respond by writing his Senator, the Bill is sure to pass. There is NO TIME left! See "Closing Comments" (p. 112) for further information.

FCC Kills PELTS

In an article tantilizingly titled, "FCC Rejects PELTS: What Now?," the *W5YI Report* reports that the FCC has rejected plans for the Personal Emergency Locator Transmitter Service (PELTS).

PELTS was to be a portable radio system for use outdoors. The FCC proposed to create PELTS in response to a petition filed by Kenneth Seymour, a cellular telephone engineer in Beaverton, Oregon. Seymour wanted to provide persons in remote areas with a way to alert others of an emergency situation and to help search and rescue personnel locate those in distress. The Commission ruled, however, that without a watch and response system, PELTS would be ineffective.

PELTS was originally slated to use part of the 220 - 222 MHz band that was taken from ham radio operators. Other than CB and some low-power Part 15 products, there are no electronic alerting options available to the general public.

CB Saves a Life

After 12 hours spent trapped in her overturned van, 42 year old Linda Myers was finally rescued by a passing motorist — not because of her sophisticated cellular telephone but by using her own ingenuity and her CB radio.

Ms. Myers, who suffers from muscular dystrophy, began her ordeal at 2:00 AM when her specially-equipped vehicle was forced off the road and down a 438 foot embankment by a rogue flatbed. The driver of the truck, says Ms. Myers, "never stopped, even after my van went over the rail. I thought I was going to die."

When Ms. Myers regained consciousness, she used her cellular phone to dial 911 but got only busy signals because she was apparently in an area of poor reception. Meanwhile, the van's batteries died and the lights went out, making her CB radio useless.

At dawn, Ms. Myers attempted to wire the CB to the battery of her electric wheelchair, using wire she stripped from the cellular phone. Three hours later, she was able to begin using the radio to contact other motorists on the highway above.

"I talked with I don't know how many people, it must have been at least 25, but nobody would stop and help me," she said. It wasn't until 11:30 in the morning that she was able to convince a passing trucker to contact the State Police on her behalf.

CB, Prostitutes, and Scanners

Police have sought charges against two Warren, Michigan, men after they allegedly used a walkie talkie to break into a Detroit police radio broadcast. The two apparently claimed to be police officers and requested help in arresting a prostitute.

Discovered after a real Detroit police sergeant heard someone using his radio code while talking to police dispatch, the two were found in a car that resembled a department-owned unmarked vehicle. Inside was a handheld radio, a mounted police scanner, a siren, a flashing red light, and women's underwear.

According to an article in the *Free Press*, one of the suspects at first identified himself as a Macomb County Sheriff's deputy. Both then said that they were members of a CB club conducting surveillance on prostitutes. According to club officials, neither man currently holds membership in their organization.

Both men were to be charged with possession of a scanner, a misdemeanor.

Taxing Broadcasts

A U.S. congressional committee has approved an annual fee schedule for broadcasters. The fees would be imposed annually on all radio (including shortwave broadcast stations), television and cable providers as well as an array of other telecommunications services.

At presstime, the fee schedule was as follows: $100 for Class II and Class III part-time AM stations; $500 for Class I full-time AMs; $100 for Class II, Class III and Class IV AMs; $500 for Classes C, C1, C2 and B FMs; $100 for Classes A, B1, C3 and D FMs; $2,000 for VHF and UHF TV stations; $100 for low power, translator and booster TVs, broadcast auxiliaries and international (shortwave) broadcast stations; $175 per 1,000 subscribers for cable systems; and $30,000 for an operational satellite.

The fees are expected to generate $65 million in revenues for the FCC.

Radio Writers Face Law Trouble

Chuck Robertson, regular contributor to *Popular Communications* magazine who specialized in low-band skip, has been arrested and charged with cultivating marijuana. At the time of his arrest in Creal Springs, Illinois, Robertson was allegedly in possession of 260 plants, records, growing lights, fertilizer, potting soil, and $23,000 in cash. Police also confiscated his radio equipment saying that he used them to monitor law enforcement communications.

According to U.S. District Attorney Bob Garrison, Robertson had a prior felony conviction on a similar charge. At that time, Robertson was found to be in possession of $64,000 in cash.

Robertson faces a possible 20 years-to-life sentence if convicted as charged. Trial date is December 2nd.

Meanwhile, a well-known pirate radio writer, Don Bishop, has been nabbed by the FCC during a 13 hour broadcasting spree that allegedly took him from Kansas to Colorado. FCC official Bob Weller, who made the stop

with the help of the Colorado State Patrol, said that a 1,000 watt transmitter was found in the car.

"Normally, such broadcasts last only 15 minutes to a half hour, which makes them hard to track," said Weller. But Bishop's broadcasts "only paused when he stopped for lunch or to get gas."

Bishop, known for his intimate knowledge of both pirates and the FCC, worked as editor of *Mobile Radio Technology* and according to a report in the *Rocky Mountain News*, "worked closely with the FCC in reporting unlicensed pirate radio stations..."

"He should have known how we worked," said a surprised FCC spokesman, Joe DiScipio. "It was incredible that we should catch him."

Officials say that the broadcasts, which could land Bishop in jail, could be heard as far away as Hawaii and Alaska.

Both Bishop and Robertson have written for *Monitoring Times*.

Ute DXers Beware

According to Mike Hardester, there's important news for all DXers who write U.S. military stations overseas. Mike says, "all FPO and APO designations on mailing addresses have changed" and many will receive new zip codes altogether. Instead of FPO San Francisco + zip code or FPO Seattle + zip code, the new designation for the Pacific will be FPO SP + zip code (the city being deleted).

Information on other overseas addresses such as FPO New York and FPO Miami, and the APO for both coasts is not yet available. Postal authorities will continue to deliver mail with the old overseas address until 15 July 1992. After that, it will be returned to sender.

Down the Drain

When *Asheville Citizen-Times* columnist Nancy Marlowe and her husband Gil needed to locate the position of their septic tank in their back yard, they tried everything. They used a thin steel probe which they poked into the dirt and hit with a mallet. No luck. A local man brought a divining rod. Still no luck. They even called the previous owner of the house and he couldn't find the septic tank.

OK. So how does all this relate to radio? Everything these people tried failed. Until a local plumber was called in. Confidently he strode up to the toilet and... dropped in a tiny radio transmitter and flushed. A small receiver tracked its "beeps" as it flowed into the previously hidden septic tank, right there under the flagstone terrace.

Ms. Marlowe was impressed with the device but laments that "the little radio is still down there, $125 down the drain so to speak," presumably still beeping away. No word on what frequency the transmitter operates on.

Horvitz Leaves for Former Communist Bloc

Robert Horvitz, the former executive secretary of the Association of North American Radio Clubs (ANARC) was slated to become Director of Radio Activities at the new "Center for Independent Journalism" in Prague, Czechoslovakia. The Center is sponsored by the Charter 77 Human Rights Foundation and the *New York Times*.

Horvitz's new responsibilities include building and managing a production studio for training radio journalists, helping broadcasters to get on the air, and working with the Czech government to reform media laws and regulations.

Robert chuckles, "I'll be taking my ICOMs (R71A and R7000) and am eager to scan the VHF-UHF bands—needed for spectrum management information, you understand—not one bit for fun!" Yeah, Bob.

Though his tenure with ANARC was a stormy one, his work on Capitol Hill on behalf of the monitoring community earned him the *MT* "Radio Hobbyist of the Year" award in 1990. We congratulate Bob Horvitz on this prestigious appointment and wish him every success.

TV and Radio Totals

As of mid year, there were 10,943 commercially licensed radio stations in the U.S. So what are you waiting for? Turn on that radio!

Credits: Harry Baughn, Brasstown, North Carolina; Calvin Beloit, Cathcart, Indiana; Ronald Berwager, Seven Valleys, Pennsylvania; Brian Cathcart, West Palm Beach, Florida; Harve Disner, Farmington Hills, MI; David B. Eason, Chevy Chase, Maryland; Rob Gerardi, Benton, IL; Mike Hardester, Camp LeJune, North Carolina; Rob Horvitz, Czechoslovakia; Ed Kelton, Barberville, Ohio; Bill Kleronomos, Denver, CO; Hugh Miller, Woodinville, Washington; Ricardo Molinar, Ft. Lee, New Jersey; Manuel Schneider, Bellevue, Washington; Bill Tuttle, Hamden, Connecticut; Radio World and the W5YI Report.

Glossary

Most abbreviations and "radio shorthand" terms will be explained in the article in which they are used, but following is a list of terms and abbreviations you will find frequently in our pages. We hope you will find it useful.

AFB	Air Force Base
AFRES	Air Force Reserve
AM	Amplitude modulation (transmission mode)
AMVER	Automated Merchant Vessel Rescue System
ANG	Air National Guard
ARRL	American Radio Relay League
ARRS	Aerospace Rescue and Recovery Service
ARTCC	Air Route Traffic Control Center
ATC	Air Traffic Control
AWACS	Airborne Warning and Control System
Baud (Bd)	Bits of data per second
BBC	British Broadcasting Corporation
BFO	Beat frequency oscillator (for reception of CW, RTTY, etc.)
CAP	Civil Air Patrol
Comm	Communication
COMSTA	Communications station
CQ	General call to anyone monitoring, inviting reply
CW	Continous wave (Morse code)
DE	(French) "from"... ID or call sign
DOD	Department of Defense
Duplex	Two-way communications using two different frequencies.
DX	CW abbreviation for distance
DXer	One who listens to distant stations
EAM	Emergency action messages
ECPA	Electronic Communications Privacy Act of 1986
EMS	Emergency Medical Service
FAX	Facsimile
FCC	Federal Communications Commission
FEMA	Federal Emergency Management Administration
FM	Frequency modulation (transmission mode)
GCCS	Global Communications and Control System
GMDSS	Global Maritime Distress and Safety System
HF	High frequency; shortwave (3-30 MHz)
Hz	Hertz: unit of frequency (formerly cycles per second)
ID	Identification
IF	Intermediate frequency
IRC	International Reply Coupon (available from post office)
ISB	Independent sideband
ITU	International Telecommunications Union
kHz	Kilohertz (1000 Hertz)
kW	Kilowatt
LCD	Liquid crystal display
LED	Light emitting diode
LF	Low frequency (30-300 kHz)
LORAN	Long Range Aid to Navigation
LSB	Lower sideband
MARS	Military Affiliate Radio System
MF	Medium frequency; includes standard AM broadcast band (300 kHz-3MHz)
MHz	Megahertz (1,000 kHz)
MOA	Military Operations Area
MUF	Maximum usable frequency
NAS	Naval Air Station
NASA	National Aeronautics and Space Administration
NG	National Guard
NNNN	End of RTTY message
NORAD	North American Aerospace Defense Command
Op(s)	Operation(s)
PFC	Prepared form card
QRM	Noise or interference
QSL	Station's verification of a reception report from a listener
QSO	A two-way communication
RAAF	Royal Australian Air Force
RAF	Royal Air Force
RTTY	Radioteletype
SAC	Strategic Air Command
SAR	Search and rescue
SASE	Self-addressed stamped envelope
SATCOM	Satellite communications
Simplex	Two-way communication using one frequency
SINPO	A signal-quality rating system (1-5) on each of the following characteristics: strength, interference, noise, propagation, overall quality
SSB	Single sideband
SW	Shortwave
SWBC	Shortwave broadcast
SWL	Shortwave listener
TAC	Tactical Air Command; tactical
TFC	Traffic (communications)
UHF	Ultra-high frequency (300-3,000 MHz)
UKOGBANI	A "Hauserism" for United Kingdom of Great Britain and Northern Ireland
USAF	United States Air Force
USB	Upper sideband
USIA	United States Information Agency
USCG	United States Coast Guard
USCGC	United States Coast Guard Cutter
USMC	United States Marine Corps
USN	United States Navy
UTC	Coordinated Universal Time-- The time at 0° longitude
Ute	Slang for utilities (2-way comms)
VHF	Very high frequency (30-300 MHz)
VLF	Very low frequency (3-30 kHz)
VOA	Voice of America
VOLMET	(French) "flying weather"
WARC	World Administrative Radio Conference
wpm	Words per minute (usually used w/ Morse or RTTY)
WX	Weather
YL	"Young lady," female operator
//	Parallel frequency

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RELM UC202-B 2 Watt transceiver on 154.57 MHz. $114.95
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RCI2950-B Ranger Comm. 25 Watt 10 Meter xcevr. $234.95
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Baltic Voices of Independence

Story and photos
by Charles Brian Goslow

Just prior to the attempted Soviet coup and the subsequent achievement of Baltic independence, Charles Brian Goslow visited the republics of Latvia and Lithuania. He was inspired to make the trip after meeting six members of Radio Vilnius on their visit to Madison, Chicago, and Montreal early last summer.

Says Goslow, "As I write this, the Latvia and Lithuania I visited only two weeks ago is very different. Structures and statues in my newly developed pictures are no longer standing and the dream of independence has become reality. People who never heard of the Baltics view daily reports from Estonia, Latvia and Lithuania on the evening news."

Not much has changed at the voices of Latvia and Lithuania, however; their courageous personnel have consistently been the voices of information and independence. Come along with us to Riga and to Vilnius to visit the studios and the staff.

Barricade at entrance of Latvija Radio and Television.

Latvia's Voice

Tourists flying to the Baltic usually land at Riga International Airport and spend at least one night at the Hotel Latvija. The building overlooks Lenin Street and the Latvian Foreign Ministry building, which, until mid-August, was "guarded" by a statue of Vladimir Lenin. Less than 100 feet away, two film journalists, whose final work, "A Baltic Requiem," aired on PBS in June, were slain. Monuments in a nearby park honor those who died from Soviet aggression on January 20, 1991, in Riga. The park stands alongside the Freedom Monument, erected during Latvia's first independence period in 1935.

Crossing Padomju Boulevard, winding past artists, newspaper vendors, and a small park, I arrived at an oval-shaped building bordered by cobblestone. I walked around the complex, passing the entrances to Latvia's finance, energy, architectural, industrial, and economic ministries. But only after 45 minutes of questions do I learn that the large collection of cinder blocks covered by paintings and barbed wire is the entrance to Latvija Radio and Television. The structure had been erected to protect the facility in January.

"I don't know why it's still there," said Uldis Cerps, preparing to record Radio Latvija's weekly English program. But, later that month, Soviet militia stormed the station, brutally evicting its staff, reminiscent of January events in Vilnius. A short time later, it returned to the air from a temporary location in the city.

During January, Popular Front guards, present to protect the government headed by Anatolijs Gorbunovs, and Latvians surrounded the block as well as other facilities important to Latvia's independence. Radio Latvija's mediumwave broadcasts were temporarily cut. "The climate was undescribable," said Cerps, who is a third-year student in a five-year program at Riga's Latvian journalism school. "All the women were asked to go out of the studios (when their emotions threatened journalistic integrity)."

The station currently operates under the guidance of the Latvian Parliament, but is expected to become an independent entity this fall. But even now, "Nobody is saying what you have to do, or you're not going to speak on that," said Ruta Visvere, Swedish program producer. "We're answering for ourselves."

Uldis Cerps, a third year journalism student, is an English language announcer at Latvija Radio.

"We have a good relationship with the government," Visvere said, noting the problem in bringing Latvia's governmental voices to the airwaves. "Only four members of the Latvian Parliament speak English, so you need a translator."

Domestic radio broadcasts began in Latvia in 1925. Currently, the country has two channels. The majority of the first is Latvian-produced with some Moscow-originated material. The second gives time to many nationalities, including Russian. Daily broadcasts of "Yeltsin's Radio" from the Russian Federation are featured.

Riga Calling

A foreign service in Swedish for Latvians living abroad was instituted in 1960. A weekly English program was added last fall, with daily news broadcasts in English and German added during the January events. Its main transmitter is located in the outskirts of Riga, while broadcasts to Europe are relayed by a transmitter in Lithuania, as well as a strong transmitter in a former Soviet Bloc country.

The station has filed an appeal with the United Nations for acquiring a new frequency. Its present 5935 kHz position is not very usable. "It depends on Moscow. They took all the best frequencies," said Visvere.

Radio Latvija's weekly English program, hosted by Cerps and Martin Gravitas, consists of political items, selections from the Latvian hit parade, and cultural features. It airs on Saturday at 1830 UTC and is repeated on Sunday at 0700 UTC. Daily newscasts in English are presented by Inese Eglite, using material compiled through Radio Latvija's domestic service, Latvian News

English Language Schedule

Radio Latvija			Radio Vilnius to North America*	
Time (UTC)		Freq (kHz)	Time (UTC)	Freq (kHz)
Sat	1830	5935	0000-0030	7400
Sun	0700 (repeat)			15180
Daily	2130 News			17605
				17690

*This schedule in effect from November 3 to February 29. A program in Lithuanian airs two hours later at 0200 UTC.

Agency (LETA), Latvian Telegraph Service and the Baltic News Service, and interviews conducted by its staff. They air each weekday at 2130 UTC.

As winter nears, Radio Latvija will be regularly audible in the United States. The station normally gets good coverage to Great Britain, the Netherlands and throughout Europe.

Daily English broadcasts are in the station's future plans, but financial shortfalls prohibit immediate expansion. Work is underway to establish a transmission point in the United States with the assistance of the Latvian-American Association and the World Association of Latvians. Radio Latvija has discussed establishing a satellite network with its Baltic neighbors, assisted by the Scandinavian countries.

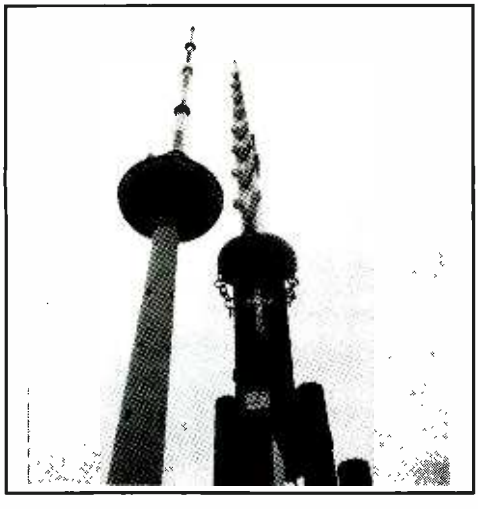
Edvinas Butkas of Radio Vilnius said the proposed satellite link would allow rural America to receive the Radio Vilnius' signal by television dish. It is expected to take two years for this to become a reality.

Baltic Teamwork

Every Friday afternoon at approximately 3 o'clock, the phone for Uldis Corps rings in the third floor office of Radio Latvija's English department. The caller is Ilona Rukiene, head of Radio Vilnius' English department, requesting an account of the previous week's events in the republic for inclusion in Radio Vilnius' weekly Baltic feature. Shortly afterward, she will call Radio Tallin's Harry Tiido in Estonia.

Radio Vilnius began the reports in 1989 during the early days of the Baltic freedom movement after listeners had written the station for information about the neighboring republics. She contacted Martin Gravitis in Riga and journalists at Radio Tallin. In January, after being evicted from its studios by Soviet paratroopers, it discontinued the feature.

"But we received letters asking us to renew the feature and started it again in April," said Rukiene. "We're glad our listeners wrote in. We try to do everything our listeners ask us to."



TV Tower in Vilnius silhouetted by memorial to those who died defending the site on January 13.

Around Vilnius

To get from Riga to Vilnius, one must either hire transport or take the Tallin-Minsk express. About an hour out of Riga Station, the train crosses into the southern-most Baltic State and I'm surrounded by the countryside described by Virginius Razmantas on Radio Vilnius every other Monday in his feature, "Around Lithuania."

Nearing Vilnius, the television tower, defended so proudly by the Lithuanian people in January, appears on the horizon. As I'm shown my room at the Hotel Astorija, my guide introduces me to "Traitor Television," not needing to explain how Lithuania's state television facilities were still under Soviet control. Lithuanian State TV, operating with a small transmitter inside the Parliament Building, was barely receivable less than two miles away.

Tuning the radio dial, Lithuanian state radio was heard with some difficulty on 666 and 1507 kHz while Vilnius Varpas (Bell of Vilnius) was heard playing pop music on 1107 kHz. During the day, Radio Centras utilizes the same frequencies, airing news and music. Both also reach the city through its electrical system.

The best place to view Vilnius is the observation deck of Gediminas Tower, its mast waving Lithuania's red, green and yellow flag high above the city. Here, all the sounds of Vilnius can be heard: trucks transporting goods, church bells,

children playing and the rehabilitation of its breathtaking churches. Down below, Gediminas Square is home to the Bell Tower, Vilnius Cathedral and President Vytautus Landsbergis' Sajudis Party's headquarters.

On the other end of Gediminas Street, which begins at the square, a large barrier of concrete blocks prohibits motor traffic into the area surrounding the Lithuanian Parliament. The building was also reinforced by concrete barriers, barbed wire, and sandbags. Antennas sat atop its roof, its wires leading to Lithuanian TV's mobile studio and the amateur radio transmitter which broadcast news of January's clampdown to the world.

Okupanta (occupied)

A bus ride away, at 49 Konarskio Street, the still occupied Radio and Television Center was being guarded by Soviet troops. From the outside the building looked deserted, its curtains stuck against its open windows. In front, six soldiers marched in procession.

"Just a year ago, it was a very nice place, surrounded with flowers near the park, cozy and nice," said Rukiene.

Across the street, the Museum of Lithuania's Freedom was staffed by journalists protesting the loss of their facilities. The 5-1/2 month chain hunger strike was based in its two trailers. Photographs, newspaper articles, children's drawings and artifacts from the year's events, such as the flag which flew from its mast and a watch from the radio studio stopped at 1:28—the time Soviet paratroopers entered the room—were displayed inside and outside the museum. A steady stream of people visited the site and its visitor's book included signatures from the Philippines, South Australia, Norway, Poland, Belgium, England, and the United States.

Many of the museum's contents will end up at the newly established Lithuanian State Museum, currently under construction at the former site of the Museum of Revolution.

Temporary Location

Three long blocks away, at 91 Naugarduko Street, are the national studios of the Lithuanian Society for the Blind. Since January, it has been the temporary home of Lithuania's national radio. It shares the fifth floor with the 21-person staff of Radio Vilnius, whose production studio wall appropriately holds a copy of the Albert Einstein Institution's "198 Methods of Nonviolent Action." In June, Soviet Interior Ministry Black Beret paratroopers occupied the premises, but, given proper warning, the staff was able to load its equipment into a car and relocate in a nearby apartment, continuing to prepare the evening's program.

Rukiene gave me a tour of the national studios and introduced me to Algimantas Sadukas,

Museum of Lithuania's Freedom. Across from the occupied studios, this memorial museum has been on show to visitors from around the world.

Temporary home of Lithuanian State Radio. Radio Vilnius' newsroom is located on the seventh floor of the apartment block on the right.

Edvinas Butkas (left) and Audrius Matonis (right) in Radio Vilnius' temporary newsroom in the nearby apartment building.

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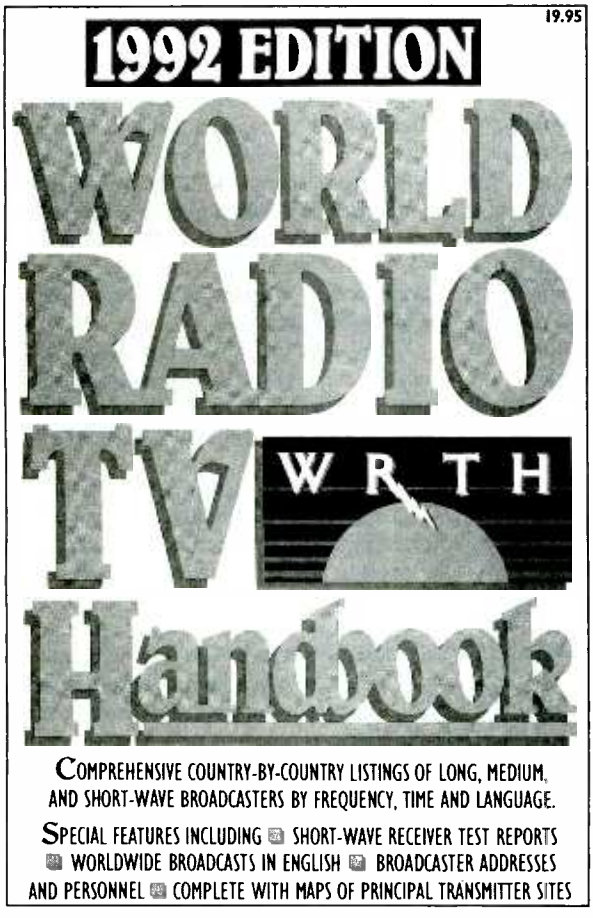

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Rasa Lukaite, Radio Vilnius' Letterbox Lady

Andrius Uzkalnis and Izolda Malyte of Radio Vilnius

Virginius Razmantas of Radio Vilnius travels the countryside to bring you "Around Lithuania"

who was the announcer on duty when paratroopers entered the radio and television center on Jan. 13. "My friends told me they were certain I'd be killed," he said, displaying how paratroopers made him stand against the wall. "I was doing it for my country."

Lithuania redeclared its independence from the Soviet Union on March 11, 1990. Rasa Lukaite, "The Letterbox Lady," looked romantically back on the independence movement's early days. "Lithuania never gave in to Russianization. Flags were kept hidden," said Lukaite. "The singing, the poetry in 1988, when the Lithuanian flag was unveiled, all these things were there, under the surface."

Baltic News Service

Radio Vilnius' production studio overlooks an apartment block complex which serves as headquarters for its news department. In a one room seventh floor apartment, news editor Audrius Matonis edits the evening's Lithuanian newscast. The five person staff doubles as the Baltic News Service's Vilnius bureau, working long days which begin at 9 a.m. and end past midnight.

"It's not a normal life," said Matonis. "Our wives are angry, our children are angry not to see us at home."

To produce "Around Lithuania," Virginius Razmantas must depart Vilnius early in the morning for the city or town to be featured on the evening's broadcast. He'll meet with its mayor and scholarly people, and try to pick up stories of its history and folklore. In the smaller towns, residents, unsure about the questioning stranger, are microphone wary. Razmantas compiles his notes on the bus ride back to Vilnius, where he'll edit and write the script for the evening's broadcast.

Journalist Audius Braukyla explained the news gathering process. "Every morning, there's a briefing for journalists in (the Lithuanian) parliament. Guests of the country, the nation of Lithuania, are announced, such as a group of American businessmen." Interviews are also arranged with visitors by their Lithuanian hosts.

But the events of the recent years have taken their toll. "Three years ago it was new and exciting," said Braukyla. "Now we're getting a little tired of politics."

True Dedication

Back at the studio, Izolda Malyte and Andrius Uzkalnis were preparing to record the evening's news feature. Uzkalnis, a second year English student at Vilnius University, looked over the script with a translator, utilizing a Lithuanian-English dictionary for proper pronunciation. Although it may not be apparent to listeners, only Lukaite, "The Letterbox Lady," is a natural speaker of English. Completion of the five minute feature requires several takes and the final product is a tribute to the patience and dedication of the station's announcers and their two female engineers.

On the final Sunday of each month, Radio Vilnius presents its "Listener's Club" program. Intended to create interest in Lithuania, membership is gained by sending 10 reception reports. In return, members receive stickers, pennants, souvenirs, and printed material. While visiting Madison, Radio Vilnius met devoted listener Mary Sabatini, who is establishing an American branch of its Listener's Club. She can be contacted at 24 Sherman Terrace, Apt. 4, Madison, Wisconsin 53704.

As of this writing, Radio Vilnius is broadcast on frequencies governed by the Soviet ministry of communications. Only the 2300 UTC broadcast on 11790 kHz has been audible in the United States, but the newly-released winter frequencies may bring more success. There is the possibility Radio Vilnius will be acquiring the use of a transmitter in Kalingrad by year's end which would cover all of Europe. The Lithuanian minister of communication is currently working on details of the arrangement.

Lithuanian's National Radio broadcasts on 9710 kHz, airing Radio Vilnius' English program at 2230 UTC to Europe. On the last Saturday of the month, Radio Centras utilizes the frequency for one hour at 0600 UTC.

"We Are At War"

Having been victims of Soviet force, Radio Latvija and Radio Vilnius have struggled with journalistic ethics during this emotional period in their countries' history. While both stations follow standards set by the BBC, they disagree on the role emotion should play in their reporting. Cerps said Radio Latvija sharply rejects the use of the word "we" in its news reporting, while Rukiene defended Radio Vilnius' use of the word because, "We are at war."

"These are things we can't be unbiased about," said Rukiene, "especially when we remember the events in January. The meaning of the word, to be unbiased, in the west, is different when we are living in Lithuania."

The day after my return to the U.S., all three Baltic states had their radio facilities seized by paratroopers as part of the attempted coup against the government of the Soviet Union. By week's end all had been returned. In addition, the Republic of Lithuania was given back its Radio and Television Center and TV tower. Inside however, seven months of ransacking and neglect make an immediate return to normal operations at the site impossible.

Having played major roles in their countries' drive for independence, the broadcasters of the Baltic Republics must now contribute to their growth. Millions of emigres, descendants, and tourists will be wishing to return or visit Lithuania, Latvia, and Estonia. How these countries are presented by their international broadcasters could determine whether or not they become a vacation spot. Speaking for myself, I wasn't disappointed.

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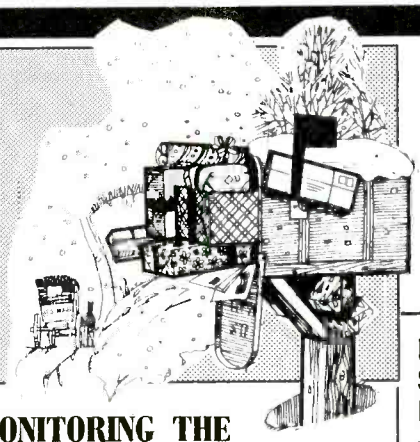

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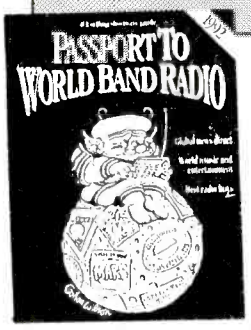

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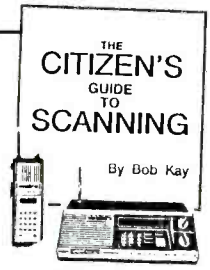

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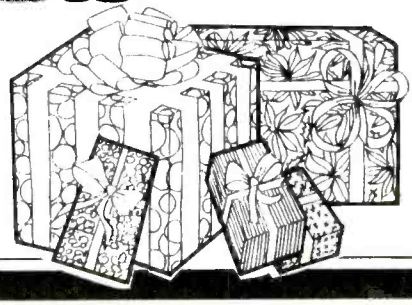

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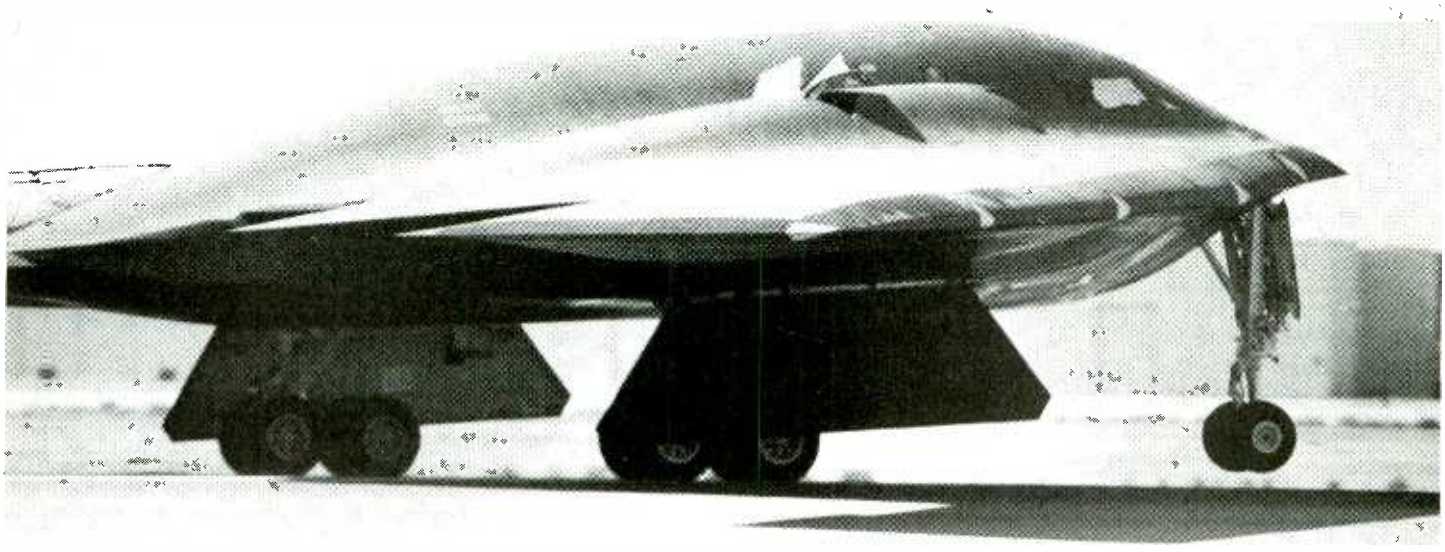
Sneak Peek at a New Stealth Aircraft

by Steve Douglass



The TR-3A is said to look like a scaled down B-2 stealth bomber.

photo courtesy
United States Air Force

Bob is a stealth chaser. He has driven more than 200 miles of hot desert road in pursuit of his prey. He peers through high-powered binoculars across the hot, arid landscape at the airfield a couple of miles away. This is as close as security gates and No Trespassing signs will let him in.

After a couple of hours in the searing desert sun, Bob starts to feel that he might be out of luck. He has driven from Las Vegas, hoping to get a glimpse of the F117A Stealth fighter in action. As the sun nears the horizon, Bob realizes the ride back home is a long one. This is his second trip to the area, and he hasn't seen a stealth fighter yet.

When Bob is about to give up, his scanner comes to life. Grabbing his binoculars, he quickly aims them at the distant base. Shuttered hangar doors slowly open, and a dark, winged shape rolls out. At this distance, and even with high-powered binoculars, it is hard to make out what type of aircraft it is. The sleek silhouette suggests a stealth aircraft. More movement at the base and then the binoculars reveal not one or two, but three aircraft taxiing for the runway. Bob smiles. This is more than he hoped for.

As the scanner squawks with the sounds of the flight taking off, Bob watches excitedly as they lift off, one right after the other, into the Nevada sky. Unexpectedly, the aircraft make a sudden turn and head right for Bob's location. As they get closer, it is apparent that these are indeed stealth aircraft. The lead fighter and his wingman have the unmistakable, sinuous lines of the F-117A Night Hawk. Almost silently they fly overhead. The whine of their engines could be heard only as they pass over Bob's location.

Trailing behind, the third aircraft approaches. Bob focuses his binoculars and is quite surprised at what he sees. Expecting to see another F-117A in flight, Bob is shocked to see that this aircraft is quite different.

It is not a Night Hawk. The aircraft is larger than the F-117s. It looks like a flying triangle. With the exception of having inward canted fins, this stealth craft looks like a miniature B-2 bomber. The bottom of the aircraft is almost perfectly smooth—its surface broken only by the various windows and apertures aimed down at Bob.

There is almost no sound, and this aircraft flies even quieter than the stealth fighters it is following. The trio passes behind a mountain top. More than a bit surprised, Bob stares incredulously into the Nevada sky, wondering just what it was he saw.

Since the early 80s, the media has been chasing rumors about a top-secret stealth spy plane. Strange, flying wing aircraft have been spotted roaming the deserts around Edwards and Nellis Air Force Bases. The announcement by the Air Force in 1988 that revealed to the world the existence of the F-117A Stealth Fighter seemed to end speculation on the subject. It must have been the F-117A that everyone was seeing; But strange flying-wing type aircraft were still being reported. Some surmised that they were seeing the B-2 Stealth bomber, but this was not the case.

The Mysterious Aurora

In 1989, rumblings about a mysterious aircraft, known only by its secret code name "Aurora," began to circulate. Leaks hinted at a hypersonic stealth aircraft that could cross continents in minutes. The Aurora was thought to be a Mach 6 stealth version of the SR-71 Blackbird. Auroras have been reported flying over the top-secret test ranges in Nevada having mysterious names such as "Dreamland" and "China Lake."

Feeding the flames of speculation among stealth watchers was the fact that the SR-71 Blackbird was recently retired by the Air Force. Many thought that if the Blackbird was deemed obsolete then what wondrous aircraft did the United States Air Force have in the wings to replace it?

F-19?

Suddenly, Kuwait went up in flames. Operation Desert Storm became headlines, and soon, reports of a strange, triangular aircraft flying in formation with F-117s came filtering back from troops in the field. Many thought it might be the F-19 stealth fighter. For years, rumors of another stealth aircraft thought to have the designation "F-19," had been circulating. Many thought a true stealth fighter existed (the F-117A is technically a ground attack aircraft), and the Air Force was hiding the existence of yet another stealth fighter from the world.

Stealth detectives point out that the designation numbers for fighter aircraft seemed to have skipped the number 19, the F-18 being the Navy's Hornet and the F-20, Northrop's Tigershark. So why was the designation skipped? Did it belong to a still secret stealth fighter?

Flying the Top Secret Skies

At McCarran International Airport in Las Vegas, Nevada, an unmarked Boeing 737 taxies off the runway. It looks like your average passenger airliner, only it isn't sporting an airline or corporate logo. Instead of taxiing to the terminal, the 737 parks itself on a ramp on the far side of the airport. A stairway is pushed up to the aircraft and soon the passengers disembark.

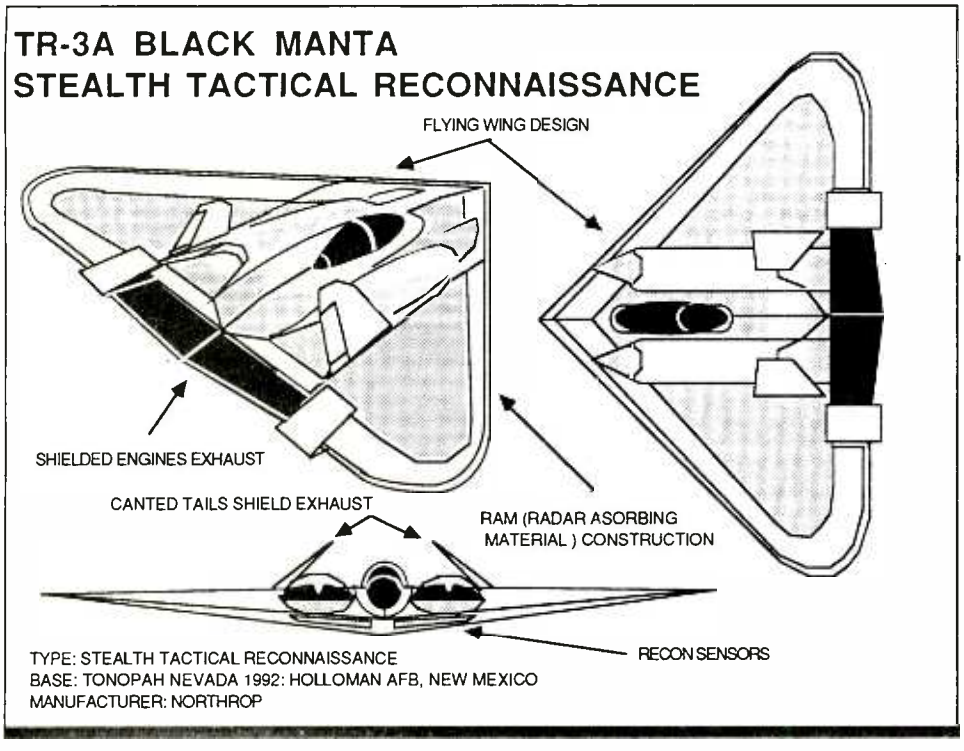
No sooner is the plane empty than it begins to fill up again. There is something strange about the passengers. All are men sporting the same military crew cuts and the same military duffel bags. The aircraft is soon in the air and heads northwest.

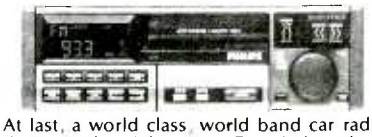
Aero monitors in the area note that there seem to be five of the mysterious airliners coming and going each day. Even the callsigns used by the aircraft are not the usual ones. Instead of "TWA Flight 335," the aircraft use the callsign "Janet" followed by three digits.

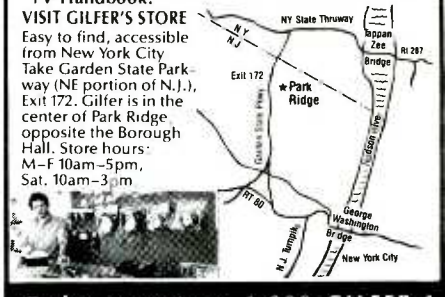
In 1984, stealth watchers discovered that specially chartered airliners were flying F-117A pilots and maintenance crews to their remote base at Tonopah, Nevada. The Nighthawk pilots were officially stationed at Nellis Air Force Base in Las Vegas and were commuting to Tonopah by leased airliners operated by KEY Air. Apparently this is the mission of the unmarked airliners leaving McCarran Airport, but stealth detectives have noted that close to 1,000 people a day are flying out on the secret 3737s. This is way too many to pilot and maintain a wing of 60 stealth fighters.

The Secret Revealed

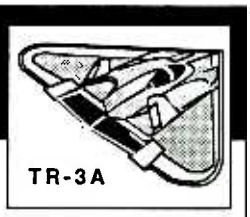
The hardest thing to keep in this world is a secret. Even the Air Force has trouble keeping their top-secret stealth aircraft under wraps, and sometimes a secret is leaked out. The reasons behind the leaks are clear. The Air Force is fighting an intense battle with Congress over the purchase of the B-2 Stealth bomber. The Air







TR-3A BLACK MANTA FREQUENCIES

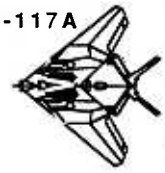

TR-3A

Edwards Air Force Base, California
UHF/VHF Frequencies

Edwards AFB app/dep :126.100,132.500,134.050,133.650, 269.200, 290.300, 295.100, 284.700, 307.200, 348.700
Edwards Tower: 120.700, 236.600,318.100
Ground Control: 121.8, 390.1
Edwards Command Post: 138.450, 304.000
Edwards Weather: 375.200
Edwards Dispatch: 372.200
Superior Range: 344.800 Leach Lake Range: 381.100, 272.000

Nellis Air Force Base, Nevada
Nellis AFB app/dep : 124.950,134.100, 279.700, 353.600
Nellis tower: 126.200, 324.300
Ground control: 275.800
Nellis TAC Command Post: 320.000, 381.300, 408.000
Nellis Weather: 344.600
Nellis Dispatch: 372.200
Blackjack Range: 377.800 Dreamland: 261.100, 255.800, Groom Lake: 361.3 Indian Springs: 358.300 Desert Range: 263.600,392.100 Nellis West Range, 338.700
Watertown Strip: 297.650

F-117A



Tonopah F-117a/TR-3A Air Field, Nevada
Tonopah app/dep: 126.950, 338.700
Tonopah Command Post : 381.300, 320.00,
Tonopah Weather : 324.800

Force is trying to prove that the multi-billion dollar bomber and stealth technology really works. What better way to promote stealth than to show how well it already has worked?

The F-117A worked exceptionally well, without a single loss or damage report during Operation Desert Storm. The success of the Nighthawk proves the point—that stealth technology does work. Unfortunately, Congress seemed unimpressed and was still trying to kill the B-2, as it had the Navy's A-12 stealth aircraft. Coincidentally, at this time unofficial leaks revealed a new, previously unknown stealth aircraft, the TR-3A.

The TR-3 Stealth Spy Aircraft

Based at the same Tonopah air field as the F-117A, the TR-3A provides real-time tactical reconnaissance imagery for the F-117A stealth attack aircraft. The total force of TR-3A "Black Mantas" is thought to number 30.

All are based at Tonopah, but the full force of TR-3s and F-117s will soon be moving to their new home at Holloman Air Force Base, New Mexico. Several Black Mantas are thought to have been deployed to Saudia Arabia during Operation Desert Storm and also to have been seen in Alaska, Great Britain, Panama, and Okinawa. By using sophisticated digital radio and real-time photo reconnaissance techniques, the TR-3A can relay critical data through airborne TR-1, AWACS, or military satellite systems. The targeting data can be relayed directly to F-117A stealth attack aircraft or to command centers on the ground.

During Operation Desert Storm, the TR-3A operated only in conjunction with F-117s. Everyone remembers the video of two bombs going through a bunker doorway located in Baghdad. The targeting imagery was thought to be from an attacking F-117A, but most likely came from a TR-3A, instead, illuminating the target with its targeting laser. Observant viewers noted that the bombs appeared to come from another aircraft and not the one producing the image. Rumors abound that the TR-3As will be used with the B-2 bomber to help locate and strike relocatable targets such as mobile nuclear missiles, or as in Iraq, Scud missile launchers.

Origins

No one knows if the TR-3A is the mysterious "Aurora" aircraft, but it is clear that the Black Manta is not a mach 5 spyplane. The TR-3A is known to have evolved from a Northrop study in the late 1970s called THAP (Tactical High Altitude Penetrator).

In the early 70s, the Air Force top-secret aircraft design group, known as the Blue Team, was formed to identify operational applications for stealth technologies produced by several aerospace companies under the "Have Blue" project. The team studied and evaluated at least 10 separate "black" aircraft programs based on stealth. These included fighter, attack, and bomber aircraft. The Blue Team studies prompted the Air Force to initiate the Covert Survivable In-weather Reconnaissance/Strike program, (CSIRS), which produced two separate aircraft designs. One evolved into the F-117a, and the other became the TR-3A.

Black Manta Design

The TR-3A is a strange, triangular-shaped aircraft about 45 feet long and 15 feet high with a 65 foot long wingspan. The aircraft is a "span loaded, flying wing design." The range is thought to be more than 3,000 nautical miles, and it has the ability to operate at both low and extremely high altitudes. It is thought to be powered by two General Electric F404 engines rated at 12,000 pounds of thrust.

Operating with multiple F-117As, the TR-3A has been seen flying near Edwards Air Force Base, California, and a daylight spotting of the aircraft was seen near Tehachapi, California. At first reports, the sightings were thought to be the Navy's proof of concept vehicle, the Navy's A-12 prototype.

Eavesdropping

Since Edwards Air Force Base and Tonopah seem to be where the TR-3A has been spotted, our best chances of eavesdropping in on the Black Mantas will be in those areas (See sidebar.) Even if you don't live anywhere near that locale, you still might be able to hear the TR-3A on some of the nationwide UHF and VHF frequencies.

Stealth aircraft need to coordinate their flights with ground controllers because having radar-invisible aircraft in their airspace can cause problems with air traffic control. Military monitors have reported TR-3As sharing the callsign "Ariel" with F-117As, as well as the callsign "BlackHawk." Try SAC primary (311.000 MHz) and SAC secondary (321.000 MHz). On shortwave, the TR-3A has been heard on SAC GCCS frequencies of 6.765 MHz, 11243 MHz, and 9027 MHz. The TR-3As are almost always found operating at night with a multiple flight of F-117As and sometimes are engaged in exercises with A-7D Corsairs and F-111D Aardvarks.

In January, the TR-3As and F-117As will be moved to Holloman Air Force Base in Alamogordo, New Mexico, which is situated in the middle of the White Sands Missile Range. Monitors in the area should keep their ears and eyes open for the Black Mantas. If you happen to be one of the few lucky ones who spot the TR-3A, snap a picture! Make sure you send it to me in care of *MT*.

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HCJB 1931 - 1991

A Celebration of Beginnings

HCJB

Story and photos by Kenneth D. MacHarg

Quick! Which station is celebrating 60th, 50th, 40th, and 30th anniversaries this year? If you answered HCJB, the Voice of the Andes, you are absolutely correct.

HCJB has been spending the year celebrating several important developments in its history. 1991 is the 60th anniversary of the radio station's first broadcast, the 50th anniversary of the first Russian language transmission, the 40th anniversary of the popular "Musical Mailbag" letterbox feature, and the 30th anniversary of HCJB's television ministry and the famous "DX Party Line" program.

The beginning of one of today's best known international shortwave radio stations goes back to Christmas Day, 1931, in a sheep shed located in the capital city of Ecuador in South America. There, founder Clarence Jones tuned up a primitive 250 watt transmitter and offered the first programming in Spanish and English on 4107 kHz. With only 17 receivers in the country, listenership was limited, but the early broadcasters received several reports from local residents.

Over time, HCJB developed programming in other languages, including Quechua, the dialect of today's descendants of the ancient Inca Indians of South America. Only two international stations broadcast in this dialect, HCJB and Radio Havana Cuba. (Other local tropical band stations in the Andean region carry Quechua programming.)

Officials of the Slavic Gospel Association were skeptical when they initiated broadcasts from HCJB in June of 1941. Yet the first broadcast was heard well in the United States and the Soviet Union. Within two years, the Russian service expanded to a daily 30-minute program, and Constantine Lewshenia arrived to prepare the broadcasts.

Lewshenia was recently honored for 50 years of service in broadcasting. Now 72, he continues to record Russian programs for hours of Russian programs per week. "We received more mail from Russia in 1990 than in the past several years combined," says Wally Kulakoff, a current Russian broadcaster in Quito.

Kulakoff is optimistic about the continued use of shortwave to reach Soviet listeners. He says it is a viable means of bringing the gospel, especially to residents in isolated areas or cities where the cable radio service carries only government stations.

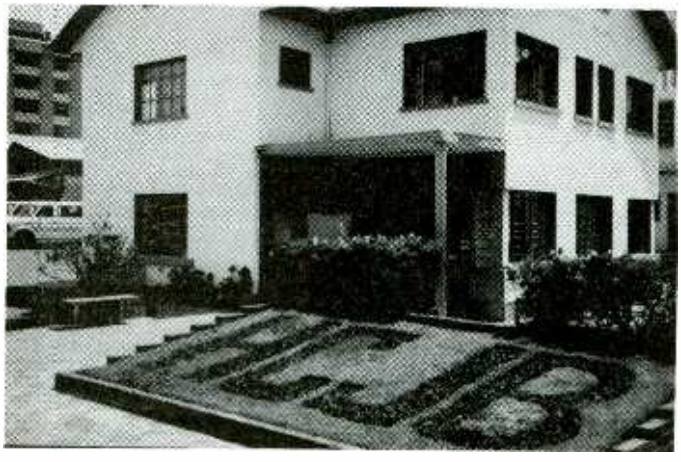
"Radio will never die," Kulakoff says. "I expect more and more Russian Christians will produce radio programs in their own country for broadcast to their own people via HCJB."

Television Comes to Ecuador

Ten tons of donated equipment were what gave the initiative to HCJB to establish Ecuador's first television station in 1961. The cameras, control board, and other material came from a defunct station in Syracuse, New York, and were used to put HCJB-TV, Channel 4 on the air.

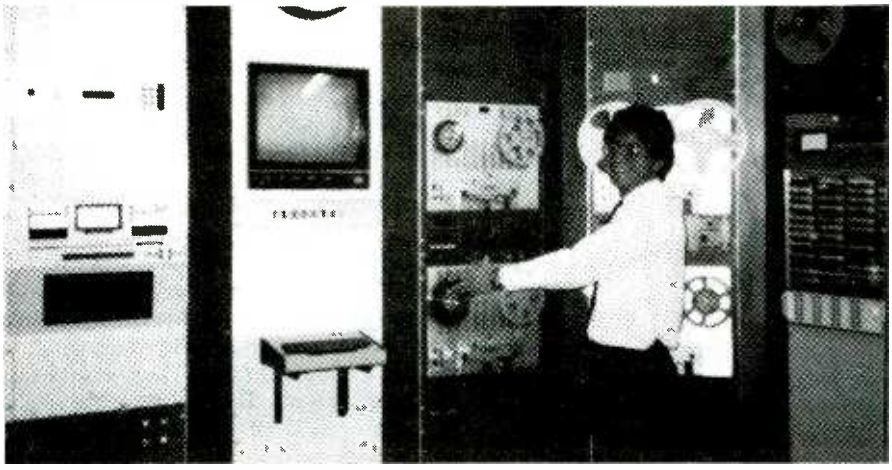
Eleven years later the cost of operating and upgrading the station was more than HCJB wanted to spend, thus the station was sold. Today, Channel 4's studios are only a block from the HCJB facilities in Quito.

Meanwhile, HCJB continues with television production in the Clarence Jones studio at the Quito facilities. In recent years, Televozandes has produced an award winning series of youth programs, a dramatic children's series, and in 1990, "Cancion de Navidad" (A Christmas Carol) which won two television awards in the United States and is broadcast each year throughout Latin America and on Spanish cable systems in the U.S.



The original building on HCJB's compound housed all studios and offices. Today it is the accounting center for the entire mission.

Wally Kulakoff is one of HCJB's Russian Language broadcasters.



Jorge Narvaez is director of HCJB's Program Automated Control System (PACS). PACS is the nerve center of the HCJB radio program operation, handling up to ten different languages or programs at one time. Computer controlled, it also sends HCJB's AM and FM signals to their appropriate transmitter sites.

Multiple Beginnings

Radio listeners are most aware of the programming anniversaries this year. "Musical Mailbag" might be described as one of the most unusual letter-box programs on radio anywhere. An eclectic mix of letters, humor, good natured banter, and food bring the listener into a fiesta every week.

It was thirty years ago that Hardy Hays (who still works with HCJB's stations in Texas) began to fill a time slot by offering an informal program of radio listening tips whenever there was a fifth Sunday,

Not long after, an HCJB engineer, Clayton Howard, developed the program into a weekly affair called the "DX Party Line." Over a period of 20 years, Clayton built his program into one of the most popular DX programs ever aired. Many DXers today learned the ropes of the hobby from Clayton's simple tips, his features on constructing antennas, and his promotion of hobby clubs around the world. An important part of each program was his "Tips for Real Living," a short feature on the Christian faith which he shared with his wife, Helen.

Since Clayton Howard's retirement in 1985, the program has been hosted by John Beck, Brent Allred, and Rich McVicar.

Current host, Canadian Rich McVicar, has expanded the program to 50 minutes each week, and tries to combine information for new listeners with DX news and tips to challenge the most experienced hobbyist.

A Gift For Innovation

When Clarence Jones decided to establish HCJB in the high Andes mountains of Ecuador, U.S. engineers scoffed at his idea. The mountains, the altitude, and the location on the equator were all seen as negative factors in the success of any such operation.

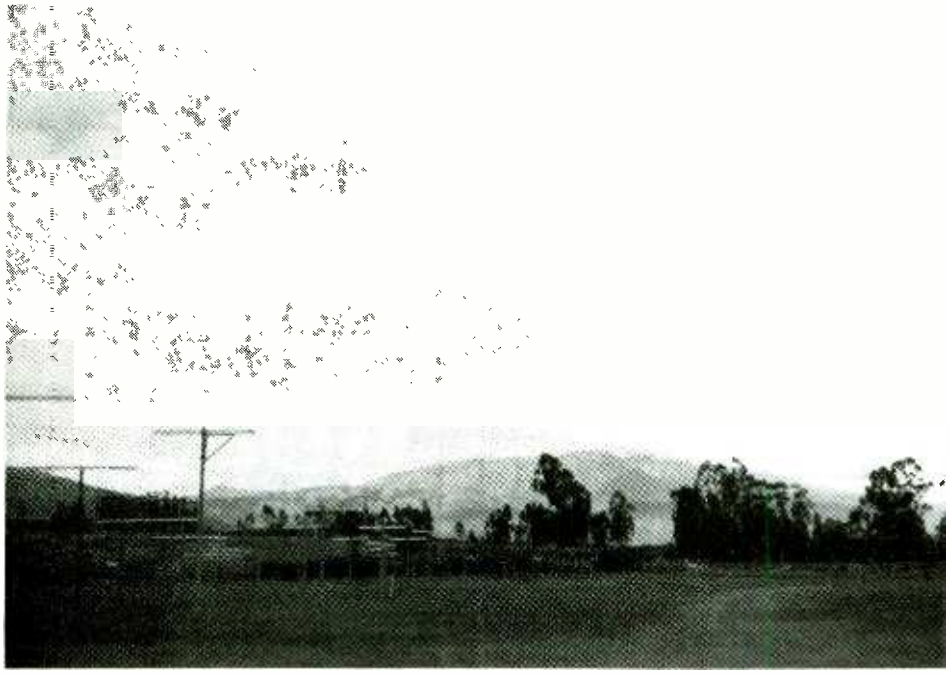
While the remoteness of Ecuador in the early days, and the effects of the altitude on high power transmissions have led to some problems, HCJB has in fact proven to be highly successful. Over the years, HCJB has led in technical developments. For example, the widely used cubical quad antenna was first designed and built at HCJB. Engineers today know of the "Quito effect," a phenomenon which indicates that, contrary to original predictions, the equator is one of the best places in the world from which to broadcast on shortwave.

Programmatically, HCJB has led the religious world in developing programming with mass appeal. Rather than offer continual teaching and preaching features, HCJB provides a broad range of presentations which attract a wide audience, Christian and non-Christian, who tune in for features on Latin America, science, hobby material, and other topics. This low-key philosophy has permitted HCJB to reach a vast worldwide audience and to rate as the most popular privately owned shortwave station in many polls over the years.

USA Today said, a few years back, that HCJB is the seventh largest radio station in the world. While it is the oldest Protestant Christian shortwave station on the air, it has also been one of the most innovative and ambitious.

A visit to the HCJB studios in Quito and the transmitter site 20 miles away at Pifo is a fascinating experience. In the center of Quito, north of the downtown area, a square block is devoted to HCJB's broadcasting operation. Walk down the hallway of the studio building and, as you pass by the studio windows, you can see in one a Japanese programmer preparing a program for his audience. Next door, representatives of the Russian service are taping. Throughout the building, one can find German and Portuguese, French and Arabic, Czechoslovakian and Spanish FM, all under production for later release to the world.

Upstairs, the Spanish AM and shortwave offices and studios turn out more than 24 hours per day of programming. While much of the AM and SW programming is duplicated, there are separate periods of broadcasting.



HCJB's huge curtain array which beams the signal to Europe.

Some language departments provide only 30 minutes of programming per week, while others fill most of the day. The German language service finds itself in the unique situation of developing broadcasts for two very different audiences. The German-speaking listeners in South America, in general, are second and third generation Christians who want programming of an educational and nurturing nature. In comparison, most of their listeners in Europe are non-Christians who are more interested in the culture of South America and DXing topics. Thus, the service must provide two very different releases to serve both areas.

Next door, in a two-building complex, one finds technical services, the folk who maintain the studios, provide telephone service throughout the mission, support computers, and operate a host of other technical complexes. Adjacent is the TV department, master control, and offices and studios for English and Nordic languages.

The PACS (Program Automated Control System) is a complex room which is the nerve center of the HCJB broadcast operations. Here a bank of tape machines send the programs in multiple languages to the various transmitter sites. As the world famous "pitada" (time tone) sounds, computers switch lines and tape decks, as over a half-dozen languages are coordinated and sent out. Should some breakdown occur, carts of emergency music automatically start to fill the void. On the half hour, other prerecorded station identification messages begin at the behest of the computer to offer a smooth transition from one program or one language to another.

Getting the Signal Out

HCJB operates two transmitter sites in the Quito area, plus several relays of the FM station around Ecuador. High on Mount Pichincha overlooking the city, HCJB has its directional 50 kW AM transmitter and the FM tower. Here also is a passive microwave reflector which bounces the signal from Quito to the shortwave site at Pifo.

To visit the Pifo site is an awesome experience. From here, the signal and message of HCJB is beamed around the world. Just over 100 acres are filled with huge antennas, each directed toward a particular part of the world. Over 30 separate antennas, ranging from a simple dipole, through curtains and a cubical quad, to the world's largest broadcast antenna—the steerable—are used around the clock.

In the transmitter hall, 12 shortwave transmitters ranging from 10,000 to 500,000 watts hum with activity. Some of those transmitters involve interesting stories. Two of them, low power, are actually owned and operated by the Quechua Indian churches of the Andes. HCJB engineers built them during spare time, and maintain them for the churches. These broadcast only Quechua language programs. In another part of the building are two Siemans single band transmitters which HCJB recently obtained from the Swiss government. Using a minimum carrier, transmissions from these transmitters have been well received throughout the world, and are opening a door to future experimental broadcasts.

Within the hall are also two HCJB-built transmitters, one of 500 kW and the newest, 100 kW. Constructed at HCJB's transmitter engineering facility in Elkhart, Indiana, they provide good service at a lower cost than a commercially purchased unit. Among HCJB's older antennas are one from RCA and one from the Harris Corporation. There is also a stand-by 25 kW medium wave transmitter at Pifo for use when the Pichincha site is out of service.

Outside are two of the most unique swimming pools in the world. Surrounded by snow-capped volcanoes and HCJB's massive antenna farm, the pools are heated by an exchange system which provides cooling for the transmitters and enjoyment for HCJB personnel.

To the east, over the continental divide where water begins its long flow through the Amazon basin to the Atlantic, is the Papallacta hydroelectric generating plant. This facility utilizes two generators to provide most of the power for the Pifo transmitting facility. Total electric output is 6 million watts. The powerline from Papallacta to Pifo runs 25 miles, passing over the continental divide through altitudes up to 14,000 feet.

A "Listener-friendly" Station

Many DXers will say that their first QSL card came from HCJB. The Voice of the Andes has a very generous QSL policy which offers six cards per year. The 1991 theme for the cards features the equipment of HCJB. For 1992, HCJB will feature the children of Ecuador on its QSL cards. In addition, during 1991, two special cards were offered, one in May honoring the 30th anniversary of the *DX Party Line* program, and one in July for reception of a special "Studio 9" call-in originating from Mt. Cayambe, a snow-capped volcano located exactly on the equator.

While HCJB is easily heard in the Americas at night after 00:30 on 9745 and 15155 kHz, and 21455 single side band, a more interesting challenge is to hear the 10 kW Quechua broadcasts on 3220 kHz from 08:30 until 14:30 UTC.

HCJB is celebrating almost a half-dozen anniversaries this year, but it continues to look ahead. A new 100 kW HCJB transmitter is due to come on line late in the year, and others are under construction. The station also owns separate local stations in Guayaquil, Ecuador, Panama, plus several AM and FM facilities along the Texas-Mexican border.

In addition, HCJB is involved with FEBC, Trans World Radio, and ELWA in a project called "World by 2000." This cooperative effort will expand facilities, add new broadcast sites, and increase the number of languages offered by the four broadcast entities. The goal is to allow all people of the world the opportunity to hear the Gospel broadcast in their own language by the year 2000. Toward this end, the group has identified around 150 languages of over one million people who currently do not have Christian broadcasts in their own language.

From the high Andes Mountains of South America, the Voice of the Andes HCJB continues to broadcast to the world. Known as a friendly station to listeners and DXers, it will probably continue to be one of the most popular broadcasters on the air in the next 60 years.

Consult the Shortwave Guide on page 62 for a complete schedule of HCJB's English broadcasts.

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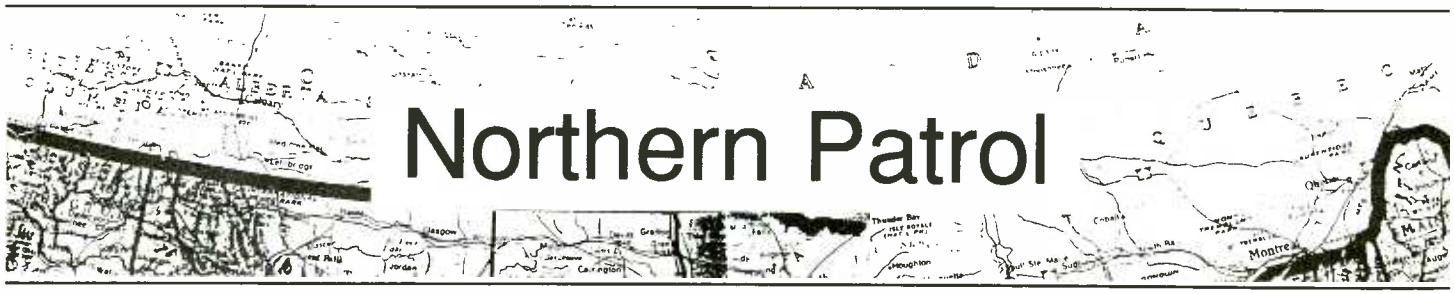

Northern Patrol

by Everett L. Slosman

The Canadian border covers 3980 odd miles of scenic wilderness: mostly marked by stone cairns. Except for the occasional and official border post, it's an open invitation for smugglers to conduct clandestine crossing.

However, jumping the border can prove dangerous, especially in winter. On a remote New Hampshire roadside, there's a simple white cross with a plaque and artificial flowers.

It marks a man's grave. He had been admitted from Canada under a false name and died of exposure trying a covert recrossing in the dead of winter. What was left of his body was found the next spring and in an act of New England charity, the town's selectmen buried him along the roadside.

The U.S. Border Patrol utilizes pursuit-type sedans when patrolling highways.

The world's longest undefended border has been porous ever since the United States was a collection of English colonies. Troops and settlers traveled back and forth with impunity. Smugglers moved liquor, silks, cattle, tobacco, and slaves either way and during the War of 1812, many border residents amassed fortunes running embargoed goods into this country.

In fact, scratch almost any old New England family and the odds are excellent you'll find a wily old border jumper or two. Many a Boston sea captain augmented their bank account by making overland forays into the "Provinces."

A Tough Assignment

The Border Patrol exists to protect our borders from illegal aliens and smuggling. Along the northern border, they work closely with other federal law enforcement agencies, Custom Service, state and local police departments, Royal Canadian Mounted Police, and other Canadian agencies.

As part of the Immigration and Naturalization Service, they come under the broad Department of Justice umbrella. Agents do not garner headlines like the FBI or have the Federal Marshall's mystique, but they run missions that prove just as important and dangerous.

Guarding our Canadian border may look like a stroll in the woods, but it's a job that demands total dedication. Daily operations consist of long routine stretches punctuated by minutes of adrenaline-tense action.

Take those 40-below winter nights when an electronic incursion sensor kicks in. It could mean a border violation, a sensor reacting to the intense cold, or a moose that strayed into the area. But, the agent patrolling that sector must investigate, and that could be risky.

In 1990, 363 agents were assaulted by a variety of bad guys while scoring a record 1.1 million apprehensions. The assailants used physical force, rocks, knives, firearms, automobiles, and clubs. No statistics are available on what the moose used.

Immigration laws date back to 1875 when Congress banned convicts and prostitutes from entering the United States, following it up in 1882 with legislation that excluded "idiots, lunatics, and persons liable to become public charges."

Then came the Chinese exclusion and contract labor laws, as well as other acts that expanded the list of groups deemed ineligible for immigration.

However, immigration law and map borders seldom stop illegals. The so-called undesirable elements continued to enter. So, in a typical 1904 reaction, the Commissioner-General of Immigration put together a mounted patrol of hard-cases.

This unit, which never numbered more than 75 men, had their hands full on the Mexican border and as more nationalities and ethnic types were declared non-gratia, it overwhelmed them.

In 1924, Congress voted a million dollar appropriation as seed money for turning a bunch of raggedy rangers into a professional enforcement organization.

Using the railway mail clerk's civil service examination register—hardly a roster designed to find qualified law officers—450 men were given Border Patrol assignments. It proved hot, dirty, and not at all as comfortable as a railway mail clerk's job. So, in the first few months, turnover ran 25 percent.

However, the enthusiasm and determination of those who stayed gradually produced a cadre of officers capable of handling the job.

On Patrol From Sea to Shining Sea

Our northern border stretches from Point Roberts, Washington, through mountains, forests, and desert along the 49th parallel to the mosquito and black fly infested Lake of the Woods, Minnesota. From there, it follows a series of negotiated lines along the Great Lakes, St. Lawrence River, New York, Vermont, and New Hampshire.

Eventually, it slides by the St. John River, dives South to the Grand Lake and on into the St. Croix River, ending up in Calais, Maine.

Once, officers rode horses almost exclusively. Now, they also use 4-wheel drive vehicles, snowmobiles, boats, and airplanes as transportation. Still, the ability to ski or snowshoe comes in handy if you're stationed along the Canadian border.

Recruits must be American citizens with a valid driver's license, must pass written, oral and physical exams, and undergo urine analysis. They must be under 35, though candidates with prior federal law enforcement experience may be granted an age waiver.

Planes and helicopters are utilized extensively throughout the border patrol.

Applicants also undergo an extensive background check. They are assigned to a Mexican border duty station for a while before spending 17 weeks at the Border Patrol Academy in Glynco, Georgia.

At this facility, they receive instruction in immigration and criminal evidence law, Spanish, agency procedures, report writing, marksmanship and firearms, departmental operations, fingerprinting, tracking, physical training, vehicle handling and pursuit driving, arrest and defensive tactics, behavorial science, statutory authority, first aid, and proper use of government property.

Then, it's back to their duty stations to complete a probationary year as a GS-5 or -7. After reaching GS-9, agents are eligible to take competitive promotion examinations. And like other federal employees, they can retire at age 50 after 20 years service.

The Hazards of the Border

Along the Canadian border, much of the Patrol's activity takes place in sparsely settled areas during inclement weather. The terrain, lack of paved roads, and undermanned staff forces them to rely on electronic motion and proximity sensors.

These sophisticated units respond to certain stimuli by alerting officers to an incursion and location. Unfortunately, a device can't distinguish between legal and other activities.

One warm night, sensors along a New England stream went haywire and officers figured they'd struck the mother lode. They raced to the scene just in time to break up a teenage skinny-dipping party. Both agents and kids finished the night red faced.

Smugglers concentrate on a lucrative two-way traffic pattern: illegal aliens and drugs from Montreal and Toronto head south and U.S. luxury goods contravene Canada's Goods and Services Tax by going north. Agents try to stem the traffic, but it's a tough battle.

Well organized rings charge would-be border jumpers stiff fees, often dumping these unfortunate, desperate people just across the border where the odds favor arrest, conviction, and deportation. But, often coming from a country like Guatemala, Senegal, or Mauritania, people are desperate enough to chance it.

To handle goods going the other way, some runners operate warehouses where they stash the liquor, electronics, and jewelry—items highly taxed and very much in demand by Canadians. These will generate high returns despite the risks involved.

Picking Up the Patrol

Monitoring Border Patrol activities, like working other law enforcement agencies, requires patience and long hours at the receiver. Most of the traffic is found in the government's VHF portion of the band, but some single sideband HF channels are still used for point-to-point activities.

Repeat scanning control and mobile frequencies until you hit paydirt. Table 1 shows the national allocations and almost any Border Patrol unit will have multiple channel capabilities.

Shared channels make another good source, especially in larger cities where federal allocations may be tight.

Table 2 includes callsign and location listings from all the regions. California has a more complex set of frequency assignments, but that will be the focus of a future article.

Logically, much of the action will take place during bad weather, on dark nights, and on holidays. These make perfect cover for illegal activities. And don't be too surprised if you hear an occasional call from outside your region when the VHF band gets frisky. That's half the fun of DXing.

Table 1
Border Patrol Frequencies

These frequencies are part of the national assignments made to the Department of Justice. Like all agencies, the Border Patrol does step outside their assigned broadcast territory.

Frequency	Type	Assignment
(kHz)		
4617.5	CW/SSB	Point-to-point
5912.5	CW/SSB	Point-to-point
9435	CW/SSB	Point-to-point
11650	CW/SSB	Point-to-point
14577.5	CW/SSB	Point-to-point
14585	CW/SSB	Point-to-point
(MHz)		
162.8250	Control/Mobile	Liaison w/Customs
162.8500	Control/Mobile Repeater/Mobile Relay,Control Link	
162.8750	Control/Mobile Repeater/Mobile Relay, Control Link	
162.9000	Control/Mobile Repeater/Mobile Relay, Control Link	
162.9250	Control/Mobile	Liaison w/Customs
162.9500	Control/Mobile Repeater/Mobile Relay, Control Link	
162.9750	Control/Mobile Repeater/Mobile Relay, Control Link	
163.0500	Simplex	
163.1000	Simplex	
163.3750	Simplex	
163.5500	Simplex	
163.6000	Control/Mobile Repeater/Mobile Relay, Control Link	
163.6250	Control/Mobile Repeater/Mobile Relay, Control Link	Liaison w/ Customs on Repeater
163.6500	Control/Mobile Repeater/Mobile Relay, Control Link	
163.6750	Control/Mobile	Liaison w/ Customs
	Repeater/Mobile Relay, Control Link	on Repeater
163.7000	Control/Mobile Repeater/Mobile Relay, Control Link	
163.7250	Control/Mobile Repeater/Mobile Relay, Control Link	
163.7500	Control/Mobile Repeater/Mobile Relay, Control Link	
163.7750	Control/Mobile Repeater/Mobile Relay, Control Link	
165.8250	Control/Mobile Repeater/Mobile Relay, Control Link	
165.8750	Control/Mobile Repeater/Mobile Relay, Control Link	
165.9000	Control/Mobile Repeater/Mobile Relay, Control Link	Shared w/Office of Justice Programs
165.9250	Control/Mobile Repeater/Mobile Relay, Control Link	Shared w/National Park ServiceControl & FBI Repeater
165.9750	Control/Mobile Repeater/Mobile Relay, Control Link	Shared w/National Park ServiceControl
168.8250	Control/Mobile Repeater/Mobile Relay, Control Link	
168.8500	Control/Mobile Repeater/Mobile Relay, Control Link	
168.8625	Control/Mobile Repeater/Mobile Relay, Control Link	
168.8750	Control/Mobile	
	Repeater/Mobile Relay, Control Link	
168.9000	Control/Mobile Repeater/Mobile Relay, Control Link	
168.9500	Control Mobile Repeater/Mobile Relay, Control Link	
168.9750	Control/Mobile Repeater/Mobile Relay, Control Link	
170.6750	Simplex	
170.7000	Simplex	
170.7500	Simplex	Shared w/Marshall's Service
413.6000	Control/Mobile Repeater/Mobile Relay, Control Link	Shared w/Postal Inspectors
413.6250	Control/Mobile Repeater/Mobile Relay, Control Link	
413.6500	Control/Mobile Repeater/Mobile Relay, Control Link	
413.6750	Control/Mobile Repeater/Mobile Relay, Control Link	
417.0500	Control/Mobile Repeater/Mobile Relay, Control Link	
418.8500	Control/Mobile Repeater/Mobile Relay, Control Link	
418.8750	Control/Mobile Repeater/Mobile Relay, Control Link	
418.9750	Control/Mobile Repeater/Mobile Relay, Control Link	

Source: *Federal Assignments Master File*, Second Edition

Table 2
Call Signs and Locations

REGION: EASTERN

Callsigns	Location
KAD 200	Washington, DC,National Office
KAD 252	St. John, VI
KAD 254	Christiansted, VI
KAD 256	Playa Del Ponce, VI
KAD 258	San Juan, PR,District Office
KAD 259	Charlotte Mali, PR
KAD 600	New York, NY,District Office
KAD 616	Van Buren, ME
KAD 620	Houlton, ME
KAD 622	Calais, ME
KAD 641	Rouse's Point, NY
KAD 644	Derby Line, VT
KAD 650	Burlington, VT,Regional Office
KAD 660	Ogdensburg, NY
KAD 680	Buffalo, NY,District Office

REGION: NORTHERN

Callsigns	Location
KAK 700	Detroit, MI,District Office
KAK 701	Trenton, MI
KAK 720	Grand Forks, ND
KAK 724	Pine Creek, MN
KAK 736-38	Hammond, IN
KAK 739	Chicago, IL,District Office
KAK 740	Harve, MT
KAK 741	Sweet Grass, MT
KAK 742	Opheim, MT
KAK 751	Wolf Point, MT
KAK 760	Spokane, WA
KAK 761	Bonner's Field, ID
KAK 780	Blaine, WA
KAK 782	Seattle, WA,District Office
KAK 786	Lynden, WA

REGION: SOUTHERN

Callsigns	Location
KAD 220	Miami, FL,District Office
KAD 221	Tampa, FL
KAD 260	New Orleans, LA,District Office
KAD 261	Mobile, AL
KAD 262	Pensacola, FL
KAD 264	Baton Rouge, LA
KAD 265	Gulfport, MS
KAK 880	El Paso, TX,Radio Canter, Detention &
KAK 899	District Office
KAK 885	Columbus, MN
KAK 890	Dallas, TX, Regional Office
KAK 900	Marfa, TX
KAK 904	Presidio, TX
KAK 920	Del Rio, TX
KAK 940	Laredo, TX
KAK 960	McAllen, TX
KAK 961	Rio Grande, TX
KAK 963	Hidalgo, TX
KAK 964	Mercedes, TX
KAK 980	Port Isabel, TX
KAK 982	Brownsville, TX

REGION: WESTERN

Callsigns	Location
KAK 800	Livermore, CA
KAK 801	Sacramento, CA
KAK 805	Stockton, CA
KAK 806	Bakersfield, CA
KAK 846	
KAK 820	Chula Vista, CA, Radio Center & Detentions
KAK 824	
KAK 821	Los Angeles, CA, Investigations
821A	Detention
821B	Night Duty Officer, District Office
KAK 822	San Clemente, CA
KAK 823	Temecula, CA
KAK 825	Campo, CA, Detention
KAK 826	Ocotillo, CA
KAK 827	San Ysidro, CA
KAK 831	Border Station
KAK 828	Oxnard, CA
KAK 829	Jacumba, CA
KAK 830	Terminal Island, CA Regional Office & Detention
KAK 832	San Luis Obispo, CA
KAK 840	El Centro, CA Radio Center & Detention
KAK 841	Calexico, CA
KAK 842	Indio, CA
KAK 843	Blythe, CA
KAK 844	Needles, CA
KAK 845	Tecate, CA
KAK 847	Riverside, CA
KAK 850	Yuma, AZ
KAK 860	Tucson, AZ
KAK 865	Nogales, AZ
KAK 870	Phoenix, AZ, District Office
KAK 872	Lochiel, AZ

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The Second Annual MT Convention

Wish You Were There

All photos by Harry Baughn

Four hundred of us turned out this year for the second annual Monitoring Times Convention. Although this was more than one hundred additional people over last year's attendance, everyone felt the relaxed atmosphere and the smoothness of schedule that comes from having one year's experience under our belt.

What began as a balmy bicentennial weekend in Knoxville, turned into very crisp fall weather by Sunday's departure.

Twenty-six exhibitors reported phenomenal response from *MT* attendees. Grove Enterprises discovered their sales far surpassed what they made at any Dayton Hamvention with 30,000 attendees. Available for sale were shortwave receivers, scanners, transceivers, demodulators, computer software, antennas, frequency counters, how-to books, frequency guides and other publications.

Other groups exhibiting were several international shortwave broadcasters: Christian Science Monitor World Service, Deutsche Welle, EWTN, Radio Finland, Radio for Peace International, Voice of America, and Voice of Free China.

Four Association of North American Radio Clubs (ANARC) were also represented.

"Your money's worth" was what you certainly got for the $35 registration fee. Twenty-eight seminars were available to choose from! In each time slot the attender generally had three choices; the hardest part of the whole weekend. The topics ranged across the entire frequency spectrum, and delved into what's there to be heard, how to hear it, and the equipment needed. Several well-attended sessions were also offered on a beginner's level.

Once again, armed with scanners, frequency counters and, yes, even a divining rod(!), intrepid sleuths raced through the halls and between the floors of the Hyatt-Regency hotel in a hunt for the hidden transmitter. They enjoyed themselves so much they kept replanting the bug long after the prizes were gone.

Tours were popular again this year. A steady stream of conventioneers invaded the 9-1-1 center for a look at the modern dispatch center featured on our cover. The Knoxville Air Traffic Control Center again gave generously of their time to explain the operation to their visitors. New this year was a tour of the ABC-TV affiliate, WATE-TV Channel 6.

Bob Grove, publisher of *Monitoring Times*, emceed Saturday night's banquet. It not only included great food and company, but was highlighted with a stirring speech by Larry Magne, Editor-In-Chief of *Passport to Worldband Radio* and *MT* columnist. Larry Miller, former editor of *Monitoring Times* was honored *en absentia* with a plaque for his five years of devoted service to *MT*.

Monitoring Times wishes to thank the following businesses for their very generous prize donations: R.L. Drake Company - R8 communications receiver; Radio Shack - PRO2006 scanner; Christian Science Monitor - Sangean ATS803A, Sangean MC103 and, Grundig Cosmopolit receivers; Optoelectronics - Opto 3000 frequency counter; Lescom: Upgrade package for the PRO2006; Grove Enterprises - TUN4 MiniTuner Plus active preselector; MFJ Enterprises - MFJ110 world map clock.

To everyone's delight and approval, the Drake R8 grand prize was won by Janet Wettenstein, who made the trip from New York in spite of being blind. Janet had been hoping to upgrade slightly from her Uniden CR2010, even if it meant buying a used receiver. Instead, the money will go to modify a *Drake R8*!

Now that you who were there have had a chance to reflect, how about sending us some of your thoughts on the Convention: What did you think of the topics, the format, the venue? Those of you who chose not to attend may have some helpful insights as well. Send your comments to "MT Convention Feedback," P.O. Box 98, Brasstown, NC 28902.

We had an enormously good time, and hope you did, too. Let's do it again next year!

Shortwave Broadcasting

Glenn Hauser
Box 1684 - MT
Enid, OK 73702

AFGHANISTAN (non) Voice of Unity, in Pashto and Dari, 1200-1255 on 15685, 15100, 12230; 1515-1610 and 0120-0225 on 17540, 15685, 12230 (BBC Monitoring)

ALBANIA (non) Voice of (Young) Albanians in Exile, new political/religious clandestine program with address in Yonkers, apparently only in Albanian, but playing music like "We Shall Overcome" scheduled Sundays 1500-1600 on WWCR, 15690, but may not start until 1505; and perhaps an hour later after DST (*W.O.R.*)

ANTARCTICA After new equipment is received, AFAN plans to reactivate 6012 kHz by late February (Lt. M.R. Reid, USN Operation Deepfreeze, HCJB *DX Partyline*)

ARGENTINA Private SW is supposedly not allowed, but pro-government Radio Libertad is still heard, 11781 at 1500-0300 (Juan Carlos Codina, Peru, via Dario Monferini, *World of Radio*)

AUSTRIA RAI has expanded English to us: 1130 on 13730; 0130 and 0330 on 9870, 9875-USB & 13730; 0530 and 0630 via Canada on 6015. *SW Panorama* is on Sunday 1130 (when also try 11780, 15450, 21490), and Monday 0630 broadcasts; also Sundays 1330 and 1530 (via John Carson)

BELGIUM BRT retimed for winter, 1400-1425 (Sundays 1230-1255) on 21810; daily 0030-0055 on 13710 to North America, 13655 South America—but during propagation disturbances, in deep North America we find 13655 better. To Europe daily 1900 and 2200 on 15515, 9905, 5910.

BOLIVIA Radio Horizontes, last heard 9 years ago on 9 MHz, is back on 4542.59 with same ID jingle, claiming 4540 kHz from Cobija, 2350-0200, 1130-1230. Radio Santa Rosa, Yacuma, on new 4420.68 at 2300-0230. A transmitter factory in La Paz tested a strong signal on 4450 without ID, probably the same one earlier around 4167; subsequently 4450 began operating from Cobija as Radio Frontera, opening at 2258 and at 1000. Previous unID on 3737-3738 is Radio Emisoras 20 de Diciembre, Culpinas, Chuquisuqui, Chucisaca, claiming to be on "6700 kcs, 90 metros," around 0000-0130 (Codina via Monferini, *W.O.R.*)

Radio Hitachi, Guayaramerin, 4530 announces schedule 1000-2400 but heard nightly until 0005 or 0015 (Rafael Rojas F., Peru, via Monferini, *W.O.R.*)

BOTSWANA 4830 is heard daytime only, 3356 nighttime only (Vashek Korinek, RSA, via Monferini, *W.O.R.*)

BRAZIL Radio Clube de Dourados, MS, reactivated after many years, on 3375 at 0118-0200 (Julian Anderson, Argentina, *W.O.R.*)

CANADA RCI has a new director, Terry Hargreaves, former CBC correspondent in Ottawa. Repeats of *Sunday Morning* retimed: hour one at 2000 on 17875, 15325, 15140, 13650, 11945; hour two at 2200 on 15325, 11945 (via William Westenhaver, *W.O.R.*)

A private SW relay charging $1000 per hour is planned for Morden, Manitoba; two 250 kW transmitters to serve east and west USA, by North American Broadcasting Co., subject to government approval (Radio Netherlands *Media Network*) Mexico would be better!

COLOMBIA CARACOL Villavicencio heard on 23820 at 1230, fourth harmonic of 5955, announcing MW 1140 (Alan Roberts, PQ, CIDX *Messenger*)

Radio Patria Libre, clandestine, on new 4710 in early September at 0001-0100, still giving 6300 where unheard (Juan Carlos Codina, Peru, via Monferini, *W.O.R.*) And a few days later on 4695 (Hans Johnson, MD, *W.O.R.*) Says times are 1130 and 0030 (BBCM)

COSTA RICA Radio for Peace International expanded to 24 hours on 15030, joined by 21465 USB after 1300, with a third repeat of 6-hour block nominally at 1200-1800, but often running late; then for 4th quarter a Spanish version of feminist show *FIRE* inserted at 1700-1800 before the English hour, with the repeats taking turns week to week. New show *Costa Rican News and Analysis*, bilingual with interviews, continuous musical background, heard UTC Sat. at 0305, but probable nominal time 2000 Fri. plus repeats. May swap AM and USB usage on 13630, 21465 (info from RFPI *Mailbags*)

CROATIA Zagreb activated its own SW frequencies, 7240 and 9830 (BBCM) Includes brief English news, such as Sun. 0840 on 9830 (Edwin Southwell, England, *W.O.R.*) Would be an hour later now.

(non) Radio Libertas no longer heard via WHRI at scheduled times, weekdays 1600 on 9465, Sundays 2100 on 13760, 17830--just as CBC *Sunday Morning* reported station backers in Toronto were involved in arms shipments (*W.O.R.*)

CUBA Relay of Moscow Russian, Spanish services noted in late September on 4745.9 ex-4765, around 0100 (Don Thornton, NJ)

ECUADOR Radio Nacional Limon, "RNL" on 1320 at 2300-0300, got a permit in August for SW 3370 (WRTH *LA-Newsletter* via *Radio Nuevo Mundo*) So far unreported.

Radio Catolica National at 0106 on 4150.07, mixing product of 980 and 5030; unID on 6599.38 at 0230-0300 with religious soapers, Ecuadorian-style; on 3579.85 an unID until closing at 0412 or 0450 with Ecuadorian anthem, though a Peruvian previously reported here (Codina via Monferini, *W.O.R.*)

Radio Nacional program via HCJB at 1730-1800 moved 15220 to 15295 (*DX Partyline*) If you hear Kikongo on 11925 at 0530-0600, don't assume it's not HCJB. This language spoken in Angola and Zaire is their latest addition (*DXPL*)

EQUATORIAL GUINEA A letter from Radio Africa 2000, on the letterhead of the Embassy of Spain, Malabo, says 6907 is 10 kW Singer brand, log-periodic antenna 60° towards Rio Muni; frequency may be varied, reports wanted compared to 6250 (via Christer Brunstroem, Sweden, *SW Bulletin*) Trouble is, Rio Muni is southeast of there, Cameroon northeast (*W.O.R.*)

ETHIOPIA (non?) Previously may have come from Sudan, now Voice of Oromo Liberation, not hostile to current Ethiopian government, is on 9540 at 1000-1100 and 1700-1800 (BBCM)

FINLAND Will they never learn? YLE gave times in EST though we were still on EDT in October; as usual English shifted one UTC hour later in mornings, 1230, 1330 and 1430 weekdays, 1400 weekends on 21550, 15400 (gh) Evening announced as 0230-0250 on 11755, 9650 (Joe Hanlon, PA)

FRANCE/HUNGARY Radio Budapest started relaying France to Africa, 250 kW at 0500-0800 on 17690; 100 kW at 0500-0600 on 11850, 0600-0800 on 15530 (RNMN) Maybe changed for winter

INTERNATIONAL VACUUM *Let's Talk Radio*, Spacenet 3, 87°W, Tr. 21, 6.2 MHz wideband audio, has started carrying *World of Radio*, Fri. and Sat. 6 pm, Sun. 9:30 am ET; also uplinks ANARC SWBC DX net 7240 Suns. 10-11 am, and *Signals* at 11 am. *W.O.R.* may also appear at unscheduled times after 6 pm other days (Jim Bass, *L.T.R.*)

IRAN IRIB in English for fall: 1130-1230 on 11930, 11790, 9695, 9575, 7215; 1930-2030 on 9022, 6140 (via Kevin Klein, WI, *W.O.R.*)

(non) Voice of the Mojahed, believed from Iraq, times and frequencies vary, and not all at once; announced 41, 49, 58, 60 and 68 meter bands; around 7120, 6540, 6130, 4750, 4600, 3557 at 0127-0330; unconfirmed at 0900-1000 on same except 5640 not 4600; 1530-1830 on 7120, 6130, 5630, 4737, 4240, 3557 (BBCM) Heard at 0127 on 4750-4740-4730,

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same program starting at 0132 on 6540, out of sync. Perhaps recorded in Baghdad, hand-delivered to two transmitter sites (Hans Johnson, MD, *W.O.R.*)

IRAQ (non) Voice of the Iraqi Opposition heard with new morning broadcast, 0256-0519 on 17950, 15600, 9570 (BBCM)

ISRAEL Israel Radio would still like to reach us in prime time; it's just that we're in the wrong place. Government would charge them triple rates for using transmitters after 1 a.m. local, says *Calling All Listeners*. Retimed English schedule for September and October: 1430-1455 Sun.-Thu. on 17590, 17575, 11605, 11587; rest daily: 1800-1815 on 17575, 15590, 11675, 11587; 2000-2030 on 17630, 17575, 15640, 11675, 11605, 11587; 2230-2300 on 17575, 15640, 15100, 11605, 11587, 9435. Expect some lower frequencies from Nov.

ITALY Legal FM 93.1 station in Macerata, Radio Music, plans to activate SW this fall, on 7115, 11575, 15015, 15355 (Mario di Iorio, *Play-DX*)

JAPAN Not having learned its lesson last winter, Radio Japan resumed 9505 to North America including English at 1400, 1500, despite Cuban co-channel.

Plans to add relay via Moscow or London next April for increased European service (Kyodo via BBCM, George Thurman)

KASHMIR (non?) Voice of Independent Kashmir has 45-min broadcasts daily at 0230, 1100, 1430 and 1630 on 5000 kHz, and at 1630 also on 5900; English, Urdu, Kashmiri; address P O Box 102, Muzaffarabad, Pakistan (Kanwarjit Sandhu, India, RN*MN*)

KIRIBATI Radio Kiribati, 14917.5, can't take IRCs but $1 for return postage; 250-watt feed to Line Islands is Mon.-Sat. 1730-1900; daily 2300-0030, 0500-0830, of which 10% is in English; relays news from New Zealand at 1800, Australia at 0000, BBC at 0500 (RNMN)

KOREA NORTH Voice for Youth Infantrymen (*Chon Yoni Popyon Tur Wihan Panson-nida*), 1400-2100 on 3000, 3025v, 5000v, with drama, music soundtracks from films (Amane Nakamura, *SW DX Guide* via *Australian DX News*)

KOREA SOUTH (non) From Oct. 27 end of DST, R Korea relay via Canada resumes winter schedule of 1130-1200 on 9650 (RCI via Bill Westenhaver)

LITHUANIA Due to permanent time change in "USSR," Radio Vilnius shifted Sept. 29 to 0000-0030, heard on 11790, probably also 15180, 17665, 17690, but lower from Nov. (*W.O.R.*)

MEXICO unID on 3390.12 between 0930 and 1200, announcing 1130 so a third harmonic (Chuck Bolland, FL, *W.O.R.*) It's Radio Fiesta, Chilpancingo, Guerrero, also heard another day on 2nd harmonic 2260 (Don Moore, MI, *W.O.R.*) Call is XECHG, 1 kW (IRCA *Mexican Log*)

MOZAMBIQUE Maputo at 1700-2000 on 4864.1 and 3210.5; Interprogram on new 4846.2, very distorted; Beira at 1830-1900 in Portuguese on 3370, local language on 3277.6 (Vashek Korinek, RSA, via Monferini, *W.O.R.*)

NEPAL Radio Nepal's schedule shows 7165, 5005, 3230 and new 4001, but heard on the top two only; external English deleted at 1115-1145; still has domestic English news at 0215, 1415; songs 0615 Sat., 0445 Sun. (Bishwa Shrestha, Union of Asian DXers)

NETHERLANDS/ANTILLES Radio Netherlands changed Bonaire relays to: Pacific 0730, 0830 and 0930 on 11895; also on 9630 at 0730; North America 0030 on 11835, 6165; 0330 on 11720, 9590. Spanish direct at 2230 moved to 2130 on 6015, 13700 (RN*MN* and *Radio-Enlace*)

NEW ZEALAND DST began Oct. 6, so widely-distributed program schedule "effective to March 1992" is one hour late. Look for *Mailbox* alternate UTC Mondays at 0330-0400 on 17770; show with an edge, *Around the World with Rudi Hill*, at same time every fourth UTC Friday, such as Oct. 25, Nov. 22. New frequency until early November for live rugby coverage in the 1200-1800 period is 9510. *Mailbox* host Tony King will guide a 2-week tour of NZ departing Los Angeles Feb. 7, including usual tourist sites plus radio installations including RNZI transmitters, ZLXA, pioneer station, Cushen at Invercargill; "special" unstated price for North Americans; info from Box 2092, Wellington. General tourist info packet by calling 1-800-3885-494 /sic/.

ZLXA, Levin, 3935 has been assigned a second SW frequency 7295, for summer daytime use; 3935 runs 0500-0900 Sundays, 0530-0900 Mon.-Fri. (Arthur Cushen, RNZI *Mailbox*)

Kiwi Radio, 5850, special broadcasts Oct. 26, 28, Dec. 14 at 0600-0730; report to Free Radio for South Pacific, P O Box 1437, Haistings (*NZ DX Times* via *DXPL*)

NIGER 6-meter hams use 50085, 7th harmonic of Niamey 7155 as propagation pilot (*DXPL*)

NORWAY RNI continues English on Sat. & Sun. only, to N. America: 1500 on 11870; 2100 on 9590; 2300 on 11925; 0000 and 0300 on 9645; 0100 and 0200 on 9605 (via Robert E. Thomas II, CT)

PAKISTAN Radio Pakistan fall English includes: 0230-0245 on 21730, 17725, 17640, 15115, 9515; 1100-1120 on 21520, 17902.5; 1600-1630 on 21480, 17725, 17555, 15550, 13665, 11570; 1700-1800 on 15550, 11570 (BBCM)

PARAGUAY Radio Encarnacion on 11939.5v, ex-11945.1, going from Spanish to Guarani at 2100 (Julian Anderson, Argentina, *W.O.R.*)

Radio La Voz de Misiones, 4259.56 from 1000, third harmonic (Gabriel Ivan Barrera, Argentina, *Radio-Enlace*)

PERU Radio Paramonga is new name for Radio La Merced, 3205, 0900-0300 (WRTH *LA-News* via *RNM* & DSWCI *SW News*) Radio Imperio is the ID heard on 4705.1, not Estacion Laser, apparently resumed old name in Rioja 0148-0205, "la reina de la Amazonia" (Pedro F. Arrunategui, Peru, via Dario Monferini, *W.O.R.*) Radio Inca del Peru, Cajamarca, back on 4237 after a while on 4275, opening around 0900, but some days 24 hours. Radio Tahuantinsuyo, Cusco, jumps frequencies, 4909 opening at 0930, previously on 4977v from 1000 (Emilio Pedro Povrzenic, Argentina) Radio Chillia, 3500.6v occasionally active when electricity available, 0130. A Cerro de Pasco station at 0100-0200 with huaynos on 3901.24. Radio San Nicolas, 3927.40v to 3928.21 at 0030, tnx to Arrunategui tip. Radio Membrillar, Cascas, Contumaza, on 4174v at 2355 announcing 4190. Radio Gran Pajaten on new 4555.50v to 4556.00, bad distorted audio needs FM slope detection, wide selectivity. Radio Alto Huallaga, 5445.03 and Radio Sonorama, 5419.12 are both on very late in competition until 0300 or 0400 (Juan Carlos Codina, copyright, via Dario Monferini, *W.O.R.*)

PHILIPPINES DZB-2, FEBC, 3330 in Calapan, Mindoro, has a 5 kW transmitter running at only 75 watts, per QSL (Geoff Cosier and David Foster, Australia, *OzDX*)

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POLAND Radio Polonia's new English schedule: 1200 on 11815, 9535; 1430 on 9525, 7285, 6135, 6095; 2000-2055 on 9525, 7270, 6135; 2200-2255 on 7270, 6135, 5995 (Robert E. Thomas II, CT, *W.O.R.*)

ROMANIA RRI heard once on 11380, punch-up error for 11830, 0400 strong in English but low modulation (Bruce MacGibbon, OR, Radio Japan *DX Corner*)

RUSSIA Deutsche Welle relays via former jammers of 200-1000 kW near Kuibyshev, Novosibirsk, Irkutsk, 19.5 hours daily in German and several other languages (TASS via Ricardo Molinar and DPA via BBCM)

After the failed coup, Russia's Radio became a 24-hour service replacing All-Union Radio-2, but with 8 hours of programming repeated twice, on many inband frequencies and these USB: 16330, 15750, 15630, 9210, 6805. Later carried some VOA programs, expressing hope for reciprocity. Moscow Echo, commercial station, also known as Radio EM, replaced 9535 with 6165, daily 0400-0700, 1600-2000, weekends from 1500 (BBCM) Hour later now, I suppose; has affinity for frequencies already occupied by Switzerland (gh)

SOMALILAND Radio Hargeisa heard on new 6390, alternate 7122, at 1000-1200, 1500-1700 in Somali (BBCM)

SOUTH AFRICA Capital Radio, Transkei, absolutely inactive on 3927, but heard on 7149.4 past 2400, seems all-night (Vashek Korinek, RSA, via Dario Monferini, *W.O.R.*)

SUDAN National Unity Radio more erratic than usual on 9535, announcing from Omdurman rather than Khartoum, from 1300 instead of 1500. Same frequency often carries Republic of Sudan Radio, Omdurman, instead (BBCM)

SWEDEN Radio Sweden has new 1-hour English to Europe at 1930 on 15270, 9655, 6065; half-hours at 1330 on 17740, 21570; 1530 to NAm on 17870, 21500; 2130 on 6065; 2330, 0100 and 0200 to Americas on 9695, 11705; 0100 also on 9765 (via John Carson, OK)

TAIWAN (non) VOFC via WYFR to Europe at 2200-2300 on 9852.5 and 11580; expected to shift an hour later Oct. 27 (*W.O.R.*)

TURKEY VOT suspended its North American service until February due to transmitter installation; try 11710 at 2300, 9445 at 2100; also in Turkish 1700-0200 on 9685, 0000-0400 on 11710 (George J. Poppin, CA, *W.O.R.*) 4th-quarter features after the news: Sun., *Details, The Blue Voyage.* Mon., *Another Spot in Turkey, Administrative Structure of Turkey.* Tue., *Ataturk in Documents and Memoirs, Turkish Album.* Wed., *Letter Box, From the World of Turkish Legends.* Thu., *Contemporary Turkish Art, Anatolia--This Enchanting Land.* Fri., *Mineral Waters and Thermal Baths, Pioneers.* Sat., *DX Corner* or *Economic Panorama.*

UKOGBANI BBC has finally filled the morning coverage gap in North America by extending Antigua 15220 until 1430, then 15205 until 1615. Unfortunately 15220 has had heavy QRMoscow, but VOA is less of a problem on 15205 (*W.O.R.*)

UKRAINE Local time is what matters for timing of external broadcasts, and this has been revamped, so Radio Kiev's hour to North America formerly at 2300 or 0000 has now shifted to 0100 UTC, best on 11790 but also announcing 11675, 12005, 15180, 17665, 17690; to Europe announced at 2200 on 5960, but heard until 2300 on 11790; also has a middle-of-night European repeat at 0230 on 9785. Lower frequencies coming soon. (*W.O.R.*)

USA WWCR was interfering with Australian communications on 7520 after 0500, so FCC ordered a move to 7395; but transmitter would not tune up on that frequency, so WWCR moved Gene Scott to 7435 after 0500. Starting in October, a triple-threat of DX programs Saturday nights on 7435: *World of Radio* at 0305 UTC Sunday, *Signals* with Kristin Kaye at 0335, and *Crossband* with Big Steve Cole at 0430-0500, all one hour later after October. *W.O.R.* times during standard time should be: Fri. 2230, Sat. 0230, Sun. 0030, 0405 on WWCR; Sun. 0030, 2130 on WRNO. Some entail frequency changes, some do not; check the usuals.

Radio Miami International pulled the 3-hour Colombian program block after Labor Day on WRNO 7355 & 7395 at 0100-0400 weeknights, because bills had not been paid; still off at monthend. Radioperiodico Panamericano, Cuban program Sunday nights shifted an hour earlier to 0100-0200 UTC Mondays, announcing it would be repeated later on CID, 9940.

Still inactive, but KCBI Dallas again registered for winter season on 9815 at 0230-1400, 15375 at 1400-0230, both 42 degrees to Canada (via George Jacobs)

What are reasons for US SWBC channels way out-of-band like WWCR 7520, KTBN 7510, etc.? (Jim Barrett, MD) 6 and 9 MHz bands are so crowded, and there is no 7 MHz broadcast band in the Americas, so it is propagationally advantageous to be able to use the 7.5 range. Each frequency must be approved individually by FCC and government, military users, subject to non-interference to utilities (see WWCR 7520 above). This is no different than authorizations on the edges of other bands, or the 13 MHz band. There may be a hidden agenda: powerful broadcasts "clear out" usage by other countries, so in a military emergency, FEMA or other agencies could take over the frequencies effectively (gh)

FCC has approved four more OOBs: 9350, 13710, 17510, 21760 (George McClintock, TN) 9350 long used our mornings as ISB feeder to Far East by VOA Delano; now also on WCSN schedule, 0200-0355 to East Africa (via George Jacobs)

Three new 250 kW transmitters at Bethany should go into use sometime in November. Hope to arrange a first-day broadcast. VOA Bethany has own QSL cards now; report to John Vodenik, VOA, P O Box 227, Mason, OH 45040 (Vodenik, Miami Valley DX Club)

VANUATU Port Vila drifting around 3943 at 1902, and on 3941.5 (Ray Everingham, Vic., *Australian DX News*) And at 0930 (Wayne Jones, NSW, *ibid.*) Radio Vanuatu Director Bob Makin sacked in a dispute over coverage of a bitter split in ruling Vanuaa'ku Party (BBCM)

VATICAN VR English at 0250 on 6150, 7305. 5935 is new frequency at 2030 past 2310 in French, English, Spanish, Portuguese, Arabic, Italian, music (*W.O.R.*)

VENEZUELA La Voz de Carabobo, 4780, Valencia, was knocked off SW when a tractor accident brought the antenna down. It is being repaired, and a new transmitter building has been constructed. The owners use it to hear their station while abroad. Radio Continental, Barinas has new DX program on 4940, UTC Mondays 0200-0400 (Jeff White, *Radio-Enlace*)

VIETNAM Voice of Vietnam has a new service for the H'mong people, 6560 in the northwest, 5020 for northern Bac Bo region, 2200-2300, 0430-0600, 1100-1330 in H'mong, Vietnamese and music for tribal people (BBCM)

YUGOSLAVIA RY rescheduled English beyond basic one-hour shifts: 1230-1300 on 17740 to North America (co-channel Pakistan, etc.), 17710, 21605; 1930-2000 and 2200-2245 on 6100, 15140; 0230-0315 to North America on 9555 (co-channel Portugal until 0300) and 11885 (Spain splatter from 11880) (Andy Sennitt, RN*MN* and gh's observations)

ZAIRE Kisangani excellent from 0400 on 11454.9 and earlier with Kinshasa relay; believe broadcast station had to take over utility transmitter, as Klingenfuss listed it as 9RS316, SSB for PTT Kisangani on 11455; now reduced carrier lower sideband (Harald Kuhl, Germany, DSWCI *SW News*)

ZIMBABWE All AM and SW transmitters are off, now using FM only (Vashek Korinek, RSA, via Dario Monferini, *W.O.R.*)

Broadcast Loggings

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

0002 UTC on 11950
CUBA: Radio Havana. Preview for tonight's program features. Interesting topics covered on the "Panorama" show were America's health care crisis and the plight of its poor Latino children. The United Nation's program on action and recovery in African nations was during this hour. Local music promotionals and Rebelde ID at 0030 UTC. (Larry Van Horn, New Orleans, LA)

0019 UTC on 11790
USSR: Ukraine SSR-Radio Kiev. Program on Ukralnian culture. Station ID at 0030 UTC and news on USSR. No parallel frequencies noted. (Steven Cooper, Worthington, OH)

0129 UTC on 3365
BRAZIL: Radio Cultural. Araraquara. Portuguese. Fair signal copy at tune-in. Announcer chat to station ID at 0130 UTC. Brazilian pop vocals past 0145 UTC. Brazil's Radio Difusora, Londrina audible on 4814.9 kHz at 0200 UTC. Station ID and pop tunes. (-ed)

0145 UTC on 9875
AUSTRIA: Radio Austria International. English/German. Interview on industry in Austria. Special with upcoming literary offerings, documentaries, and radio/TV features. Parallel frequency 9870 fair and 13730 kHz poor. Station ID and music from Strauss. German service at 0200 UTC. (Jack Davis, Birmingham, AL) (Richard Lowry, Norfolk, VA)

0201 UTC on 9650
SWITZERLAND: Swiss Radio International. International news and "Swiss Radio" ID. Audible on parallels 9885 kHz (excellent) and 17730 kHz (fair). News headline repeat to featured news on the USSR and excerpts from Swiss newspapers. Item on Swiss/Polish relations and United Nations program on African recovery. (Brian Bagwell, St. Louis, MO) Audible on 13645 kHz at 1358 UTC with Asian service. (David Gasque, Orangeburg, SC)

0203 UTC on 9475
EGYPT: Radio Cairo. Station address and ID at tune-in. Instrumental Egyptian music and very dry commentary on the national government policies. Pop vocals, time check with signal pips and international newscast. Parallel frequency 9675 not heard. (Davis, AL)

0228 UTC on 9555
PORTUGAL: Radio Portugal. Portuguese/English. Lady with multilingual IDs and frequency schedule. English service at 0230 UTC. Excellent on parallel 9705 kHz. International newscast to repeat IDs. Musical fanfare introduced "Welcome To Portugal" travelogue show on Portugal's grape industry this year. (Davis, AL)

0230 UTC on 5015
BRAZIL: Radio Pioneira. Portuguese. Clear station ID and Brazilian pop tune. American pop/rock vocals to ID repeat and time check. Brazil's Radio Inconfidencia audible on 6010 kHz from 0245-0300 UTC, with good signal quality for pop vocals and IDs. (Bagwell, MO)

0240 UTC on 4895
COLOMBIA: La Voz Del Rio Arauca. Spanish. Soccer game commentary and musical jingles for cola. Time check break at 0253 UTC. Quick station ID at 0300 UTC, returning to soccer play-by-play action. (Frank Hillton, Charleston, SC)

0303 UTC on 7415.1
UNITED STATES: PIRATE-Mystic Voice of Western Prairie. Old-style country music vocals from Roy Rogers, Gene Autry and Marty Robbins. Several IDs and noted "This station is dedicated to the preservation of beautiful western prairie music." Continued tunes to 0349 UTC with echo effect ID and audio fade out to sign-off at 0350. (Van Horn, LA)

0345 UTC on 7415.1
UNITED STATES: PIRATE-Alliance for Free Radio. Sign-on ID and pirate address. Interview on shortwave/pirate radio and Radio Havana. On air promo #7 "FCC Repellent," and announcer "Radio Animal" with verification information. Program off abruptly at 0511 UTC. (Van Horn, LA)

0450 UTC on 9486
PERU: Radio Tacna. Spanish. Terrific signal quality for 30 minutes of monitoring. Male/female announcer duo. Local time check and station ID at the hour. News interspersed with vocals. Checked for additional Peruvian. Radio Imagen on 4970 kHz yielded only a tentative ID. Spanish musical vocals noted at 0650 UTC, with very weak announcement break at the hour. (-ed.)

0500 UTC on 5286.5
CHAD: Radio Moundou. French. Sign-on at the hour with African music. Station identification and frequency quote. Newscast and brief recitations with fair signal copy. (Frank Jaffee, Creston, KY)

0650 UTC on 14917.6
KIRIBATI: Radio Kiribati. English/Kiribatese. Island choral music to 0655 UTC. Announcer in English with local comments. Multilingual news topics to 0700 UTC. BBC news relay included in programming. (Wright, MS)

0833 UTC on 6150
COLOMBIA: Caracol-Bogota. Spanish. Tune-in to "Sentila" commercial and spot for program entitled "Progressiva Negra." Talk and numerous IDs followed. (Gasque, SC)

0843 UTC on 6185
MEXICO: Radio Educacion. Spanish. Radio soap "En Tierma" at tune-in. Station ID and music by John Coltrane. (Gasque, SC)

0845 UTC on 5045
BRAZIL: Cultura do Para. Portuguese. Lots of Braz tunes to 0900 UTC. DJ chatter and trademark morning barnyard sound effects. Lengthy IDs with very good signal, and little interference. (Gasque, SC)

0915 UTC on 6115.8
COLOMBIA: La Voz del Llano. Spanish. Music at tune-in to spot entitled "Momento de Reflection" with numerous Bogota, Colombia, references. "La Hacienda" program on microeconomics from 0949-0959 UTC. Station ID and Colombian music. Great signal. (Gasque, SC)

0928 UTC on 3905
PAPUA NEW GUINEA: (New Ireland) Radio New Ireland. Great morning for Papuan signals. Island musical vocals at tune-in. Tone signal and time check with ID at the half hour. DJ chat, local PNG evening announcements and mention of city Kavieng. Audible up to 1045 UTC. (Brian Dougherty, Harrisburg, PA)

0940 UTC on 4810.2
PERU: Radio San Martin. Spanish. Peruvian vocals and haunting instrumentals. Several clear IDs accompany local time checks. (Hillton, SC)

0950 UTC on 6191.7
PERU: Radio Cuzco. Spanish. Peruvian huayno music at tune-in. Fair signal quality for local announcements and ID. Additional Peruvian station Radio Andina heard the next morning on 4995 kHz at 1000 UTC, with similar programming and IDs. (Hillton, SC)

1000 UTC on 4950
PERU: Radio Dios de Madre. Spanish. Definite "Dios de Madre" ID at the hour. Usual music/talk format and ID repeat at 1030 UTC same as 1000 UTC. Considerable noise on this frequency. Station is reported in the WRTVH as Madre de Dios this same frequency. However, ID given as noted above. (Gasque, SC)

1005 UTC on 4607.3
INDONESIA: (Irian Jaya) Radio Republik Indo-Serul. Indonesian. Clear station ID. Pop and instrumental tunes to news. RRI-Kendari (Sulawesi) audible at 1045 UTC on 4000.2 kHz. Lady DJ presents news-type topics, two station IDs, and chats with colleague. (Dan Roshelli, Richmond, CA)

1025 UTC on 4753.3
INDONESIA: (Sulawesi) Radio Republik INdo-Ujung Pandang. Indonesian. Beautiful Indonesian instrumental at tune-in. Station ID at the half hour. Newscast by male announcer, followed by music tunes. (Roshelli, CA)

1100 UTC on 11760
INDONESIA: (Java) Radio Republik Indo-Jakarta. Indonesian. National newscast to clear station identification. Anthem type tune to Indonesian style music and easy-listening vocals. Very good signal copy, and excellent for reception report details. (Roshelli, CA)

1130 UTC on 4914.7
PERU: Radio Cora del Peru. Spanish. Station ID at 1130/1133 UTC. Mostly talk format and considerable fade out by 1145 UTC. Tentative Peruvian national anthem at 1152. (Gasque, SC)

1230 UTC on 21635
FRANCE: Radio France International. North American service with news at the half-hour. A look at the French newspapers and French films. "Look At Science" and headlines recap. ID and sign-off. (Cooper, OH)

1820 UTC on 17880
ASCENSION ISLANDS: BBC World Service. African service with news topics on the nations of Cameroon, South Africa, Zaire, Somalia, Sierra Leone, Nigeria, and Togo. World news at the hour. (Wright, MS)

2043 UTC on 15070
UNITED KINGDOM: BBC. "Science in Action" program on a new spider found in Australia. "Seeing Stars" program discussing the Milky Way, Perseid meteor shower and Saturn. "Science in Action" audible on 15070 kHz at 2043 UTC. (Bob Fraser, Cohasset, MA)

2200 UTC on 5960
CANADA: Radio Canada International. "Comedy Classics" skits from Hancock's Half Hour. (Fraser, MA) Also audible 2337 UTC on 9755 kHz with political comedy routines from "Focus On British Columbia." (Hillton, SC) (Wright, MA)

2241 UTC on 9445
TURKEY: Voice of Turkey. Closing comments on "Economic Panorama." Station ID as "Voice of Turkey from Ankara." Turkish folk tune to English sign-off at 2248. (Cooper, OH)

2312 UTC on 6299.38
HONDURAS: Sani Radio. Spanish. Fair signal for male announcer talking at tune-in. Rapid news coverage of Honduras. Brief excerpts from a taped speech suffering from some utility interference. Echo-type announcement and station identification. National anthem and station sign-off at 0005 UTC. 6299 kHz is a new frequency from former 4755 kHz. (-ed.)

2327 UTC on 5047
TOGO: Radio-TV Togolaise. French. Easy-listening American vocals. Utility interference on 5046.2 kHz as lady gave three/two digit English number station routine. DJ with clear station ID and Togolaise national anthem. Sign-off at 0002 UTC. (-ed.)

2340 UTC on 15335
MOROCCO: RTV-Marocaine. Arabic. Traditional Arabic vocals and pop tunes presented by a DJ format. Announcement breaks and station identifications. International newscast at the hour, followed by Arabic recitations. Morocco's Radio Mediterranee International heard on 9575 kHz at 0045 UTC with fair signal quality. Arabic music at tune-in to sign-off ID and anthem at 0059. (Davis, AL)

2345 UTC on 13710
BELGIUM: BRT. Classical music interpretation. Slightly weaker signal quality on parallel frequency 13655 kHz. Station ID/frequency quote to interval signal and sign-off at 2357 UTC. (Lowry, VA)

Great logs—keep 'em coming.

Utility World

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Airline Communications

Most of the time, communications are simply routine. However, there are times when things get real interesting if you're in the right place at the right time. The same goes for HF aeronautical communications, used by aircraft navigating across oceans and major land expanses. I have had several requests to feature additional HF families of frequencies after I did the North Atlantic Family in the April 1990 issue. Specifically, several readers have requested the Pacific regions. But first, let's take a look at what these frequencies are all about.

All commercial airline carriers must travel on established flyways in the sky. These air interstates are invisible to the naked eye, but can be defined by geographical coordinates, much the same as automobile highways. At predetermined points along these air routes (airways), commercial aircraft are required to report to an ATC (Air Traffic Control) ground station.

Most U.S. flights are domestic in nature, and they use the VHF spectrum from 118 - 136 MHz to communicate with ground ATC stations. In most areas of the world domestic and regional flights will use the VHF spectrum, although some regional activity, especially in Africa, does show up on the HF spectrum. The major HF ATC activity we hear involves the International Flight Service Stations (IFSS), which operate on frequencies between 2 to 22 MHz in the HF bands.

Each of these FSS (Flight Service Stations)/IFSS ATC facilities has geographical boundaries assigned to their airspace (FIR-Flight Information Region) and any aircraft, commercial or military, flying within or through their areas must establish their guard (communicating frequency) with that ground frequency.

As commercial pilots fly on the invisible interstates, they fortunately don't have to sit with their headsets on and listen continuously for messages from ground control stations and other aircraft traffic. They use a system called SELCAL (Selective Call) Paging.

SELCAL is used to alert a specific aircraft that a ground station wishes to contact them. Each aircraft (actually the aircraft's radio) has its own unique four letter code (set of four distinct frequencies) that the ground station can transmit. When the SELCAL system is activated the cockpit crew will hear a ding-dong type signal on the flight deck. Also the amber IFSS light flashes on an overhead panel. That lets the pilot/communications officer know it is time to put the headset on and talk to the people on the ground.

Most commercial aircraft carry two HF radios, some carry three. Usually one radio is designated as the primary radio and it is used for all HF communications. Sometimes you will hear the pilot ask for a SELCAL check on the secondary radio necessitating the SELCAL code for that radio being passed to ground control.

ARINC (Aeronautical Radio, Inc) is responsible for issuing SELCAL codes and they are suppose to be unique. Sometimes, however, this is not the case, and you might hear a ground controller catch an exception right over the air.

If the aircraft is flying through an area that does not support SELCAL or it is non-operational, the flight deck crew has to leave their headsets on until they are out of the area.

As a monitor, you will hear the ground controllers and aircrews identify SELCALs phonetically, such as EKAC - Echo Kilo Alpha Charlie, a Qantas Airline 747.

If you are really interested in SELCALs then the book *High in the Sky* is just what you need on your Utility World bookshelf. It gives a lot of the different SELCALS that have been monitored in recent years. For more information, availability and price write to: The Aviation Hobby Shop, 4 Horton Parade-Horton Road, West Drayton, Middlesex, England UB7 8EA.

I mentioned "Qantas" in my discussion of SELCAL codes. Qantas is the major air carrier of Australia that flies many Pacific area routes. You will hear several Qantas flights if you tune into Pacific HF aeronautical frequencies. These frequencies can be heard if you use the following as a guide: Use 13 MHz and higher HF frequencies in your late afternoon; 11 MHz and lower early morning to mid morning.

The following are the areas and frequencies used in the Pacific Region. This is an up-to-date list which reflects some some major changes.

Central West Pacific (CWP)
Guam 2998 6532 8903 11384 13300 17904
Hong Kong (127.1) 3485 5655 6532 8903 8942 13300 13309
Honolulu (131.95) 2998 4666 6532 8903 11384 13300 17904
Manila (124.9) 2998 6532 6562 8903 13300 17904
Naha (126.9) 2998 4666 6532 8903 11384 13300
Port Moresby (120.9) 2998 6532 8903 13300
Taegu (125.7 6425 6665 6675
Taipei (127.3) 6532 8903 13300
Tokyo (127.3/127.4) 2998 3455 4666 6532 8903 11384 13300 17904

North Pacific (NP)
Honolulu 2932 5628 6655 8951 10048 11330 13273 17904
Tokyo (126.7) 2932 5628 6655 8951 10048 11330 13273 17904

Central East Pacific (CEP-1)
Honolulu 3413 5574 8843 13354 17904
San Francisco (129.4/131.95) 3413 5574 8843 10057 13354 17904

Central East Pacific (CEP-2)
Honolulu (131.95) 5547 11282 13288 17904
San Francisco (129.4/131.95) 2869 5547 6673 11282 13288 17904

South Pacific (SP)
Auckland 3467 5643 8867 13261 17904
Honolulu (131.95) 3467 5643 8867 13261 17904
Nadi (126.7) 3467 5643 8867 13261 17904
Pascua/Easter Island (126.9) 4669 5643 6649 8667 13300
Rarotonga (118.1) 3425 6553 8846 11339 13354
Sydney 3467 5643 8867 13300 17904
Tahiti (126.7) 3467 5643 8867 13261 17904

I have included in parenthesis VHF frequencies that are associated with international air traffic over water areas. Monitors within VHF range should find some interesting monitoring on these frequencies. Thanks to all those of you who wrote requesting these Pacific frequencies.

Common LDOC Frequencies

Well, since I am on a roll talking about airplanes and communications, I might as well stay with it. LDOC's (Long Distance Operational Control) aren't monitored very much but some interesting things can be heard on LDOC channels. These frequency are used for airline company operations. Those of you that hang out on the VHF-Air channels and listen to ARINC communications (in the 129.2-132.0 MHz range) should feel

comfortable on LDOC channels. ARINC operates all of the continental U.S. stations. Others operate foreign sites.

Once airborne, aircraft usually call in to pass on departure/arrival times, passenger loads, fuel onloads, maintenance status of the aircraft and other required data.

I found a nice little list of stations in some Jeppsen publications for Northwest Airlines frequencies. While this is definitely not all the LDOCs and their frequencies, it should be enough to get you started.

New York	ARINC	3494 6640 11342 13330 17925 21964
Stockholm	Sweden	5541 8930 11345 13342 17916 23210
Berne	Switzerland	4654 6643 10069 13205 18023 23285
Honolulu	ARINC	3013 6640 11348 13342 17925 21964
San Francisco	ARINC	3013 6640 11342 13348 17925 21964
Houston	ARINC	5529 10075 13330 21964
St. John's	Rainbow Radio	5604 8819 13285 17910

Using Active Antennas

Ute World reader Guy Lee wants to know can you use active indoor antennas with popular portables without getting an overload problem? That is a very good question, considering how popular portables and indoor antennas have become.

Guy, a lot depends on the receiver you are using. On average, overloading is not as much of a problem in the utility bands as in the shortwave bands. Transmission powers and signal strengths are not as strong as in the broadcast frequencies. The best thing I can tell you is to give it a try. The different conditions and stations you will encounter will probably give you an overall positive result. Just be careful of image problems that can occur and be prepared to cut the active indoor antenna down to a simple wire if overloading occurs.

LORAN Beacons

Long time beacon expert Dave Frantz reports that LORAN navigation beacons can be heard on 2100 kHz. The master station is located on Carter's Cay in the Bahamas, about 30 miles northeast of Freeport. Other transmitters in the network include Marsh Harbor and North Eleuthera Island.

Dave thinks there are more but they haven't been identified yet. He also feels these stations are associated with NASA's Eastern Test Range, since he has noted they are on the air whenever a rocket blows up.

There is a voice network associated with the LORAN beacons on 7525 kHz in USB during the day. Stations on the net order parts and provisions which are flown in by helicopters.

Dave says that when the LORAN beacons are on the air on 2100 kHz, it sounds like a 100 Hz warbler. The master station is on 2100 kHz and the slave stations are 100 Hz higher and lower. These stations are not on the air all the time, but when they are, they are on 24 hours a day.

Also, Dave reports on a new beacon and TIS (Traveler Information Station). Low band monitors might want to check out 526 kHz for ELS located on Stellemerris, Bahamas. There is also a new TIS station on 530 kHz from the Sawgrass Mills Mall in Fort Lauderdale, Florida. The station transmits 24 hours a day with information about the new mall.

If you are a ham radio operator, Dave has some propagation beacons you might be interested in. His 28204 kHz operates 24 hours a day in CW from Blue Ridge, Georgia, about 80 miles north of Atlanta. That beacon is automatic. He also has manual beacons (controlled by phone lines) on 10140, 14066 and a 179 kHz LOWFER beacon. Dave QSL's 100% to accurate reports for his beacons with a data letter to: David Frantz, 13324 SW 28th Street, Davie, Florida 33330. Look for the beacons transmitting Dave's call sign WA4SZE.

Strange Envelopes

Here we go again. I have told you all many times that I get weird mail and envelopes. This time it comes from: Air America, Hangar 137-C, Tan-Son-Nhut AFB, Saigon R.V.N.

Now I know the name and address on the unsigned letter are bogus, but here's the scoop anyway. Air America reports that there are some very interesting nets relating to the I.E.A. activities in the 6.6 plus MHz area. I.E.A. stands for the International Energy Agency. Anybody else have any additional information and exact frequencies, be sure to drop me a line.

New German Marine Frequencies

As most of you are aware, we are now working with a new Marine band frequency spectrum. Ute World regular Tom Hite sends us this update for Nordeich Radio in Germany as announced over the air.

DAJ	4396/4104 6501/6200 8767/8243 13146/12299 17287/16405 22714/22018
DAK	4390/4098 8761/8237 13098/12251 17311/16429 22807/22111
DAI	4423/4131 8776/8252 13128/12281 17341/16459 22762/22066
DAH	4393/4101 8800/8276 13110/12263 17356/16474 22759/22063
DAP	4357/4065 8788/8264 13089/12242 17269/16387 22744/22048

In a recent column, I carried information on two unid stations DGR28 and DGW36 (17082 and 22361 kHz respectively). The owner of these stations is "Deutsche Bundespost" (transmitter monopoly in Germany) broadcasting from Elmshorn, but the station is used by DPA (Deutsche Presse Agency). The broadcasts are called "Pressefunk fur Seefahrer" (Press broadcast for seamen/sailors). These broadcasts are in Morse code (A1A/CW) and also in RTTY (SITOR-B). The power used for the broadcast is 20 kilowatts. The schedule is as follows:

6418.5	DGF41	SITOR-B	2000-2015 UTC
8439.0	DGH43	currently inactive	
12953.0	DGM95	currently inactive	
13364.0	DGN36	currently inactive	
17082.0	DGR28	SITOR-B	0800-0815 UTC
		CW	0820-0845/1620-1645 UTC
22361.0	DGW36	CW	1620-1645 UTC

Part of the DPA-text usually originates from HAB-Hambergen Rhendblatt (Hamburg evening newspaper), a well-known commercial marine newspaper.

Besides the Elmshorn transmitter, the Deutsche Bundespost (German federal post) operates from three other places in Germany.

1) Bonames/near Frankfurt	RTTY	Call sign DFA-DFZ
2) Usingen/near Frankfurt	CW	Call sign DFA-DFZ
3) Zehlendorf/West Berlin		Call sign DBA-DBR

Elmshorn is used for overseas transmissions (PTT, Press, weather for the commercial navy, etc). Bonames (RTTY only) is used for overseas and continental connections (PTT, Press, Numbers Stations-DFD37/DFD21, Sports reports-DFD89/DFE25, Deutsche Welle feeders/talk backs, FAX [DPA], MFA [Press reviews for ambassadors], relays for Japanese news agencies). Usingen (CW only) is the CW service for Bonames.

Many thanks to Karl in Germany and Tom for the update. If anybody else has additional new information on the new marine band frequencies, please be sure to send them to Utility World.

The Ute World Top 10 frequencies are on hold until next month. I am out of pocket (and the mail box) in Norfolk, VA, on a Navy road trip, so the Top 10 can't be presented. I hope you all enjoyed the convention and for those of you who didn't make it, plan now for next year! Now it is time to see what is happening in the Utility World.

Utility World

Utility Loggings

Abbreviations used in this column

AFRTS	Armed Forces Radio and Television Service	NDB	Non Directional Beacon
AFTN	Aeronautical Fixed Telecommunications Network	OBS	Observation
AM	Amplitude Modulation	Ops	Operations
AUSREP	Australian Report	PROG	Prognostic
BAC	British Aerospace Corp	QTC	Awaiting Traffic
CG	Coast Guard	Radphone	Radiotelephone
comms	Communications	RAF	Royal Air Force
COMSUBRON	Commander, Submarine Squadron	RCC	Rescue Coordination Center
CQ	General call for any station	RTTY	Radioteletype
CW	Continuous Wave (Morse Code)	RY	Special RTTY Test Tape
DE	French word meaning 'from'	SAM	Special Air Mission
FAX	Facsimile	SAR	Search and Rescue
FM	Frequency Modulation	SATCOM	Satellite Communications
GCCS	Global Command and Control System	SFC	Surface Forecast Chart
HF	High Frequency (Shortwave)	SITOR-A	Simplex teleprinting mode A (ARQ)
hr	Hour	SITOR-B	Simplex teleprinting mode B (FEC)
IDed	Identified	UN	United Nations
ISB	Independent Side Band	unid	unidentified
kHz	Kilohertz	USAF	United States Air Force
LSB	Lower Side Band	USB	Upper Side Band
MED	Mediterranean	USCG	U.S. Coast Guard
Meteo	Meteorology	UTC	Universal Time Coordinated
MHz	Megahertz	VFT	Voice Frequency Telegraphy (sometimes known as FDM)
M/V	Motor Vessel	VOLMET	Aviation weather stations
		VWD	German Press News Agency
		WFM	Wideband FM

All times are UTC and all frequencies are in kHz (kilohertz unless otherwise indicated.

129.1 DCF45-VWD new agency Frankfurt, Germany with financial news using 300 baud RTTY at 1455. (Andy Boender-The Netherlands)

147.3 DDH47-Deutsche Wetterdienst with CW weather broadcast at 2115. Boender-Netherlands)

344.0 XX-Abbotsford, BC Canada NDB at 0307. (Orv Lyttle-Burnaby, BC Canada)

368.0 V-Vancouver, BC Canada NDB at 0409. (Lyttle-BC)

410.0 5 LPM-M/V World Duett sending DE 5LPM in CW for over 2 hours at 0820. (Boender-Netherlands)

425.0 M/V Aleksandr at 1040 and M/V Earl Trader at 1514 working Norddeich Radio in CW. (Boender-Netherlands)

429.0 OXB-Blavand Radio, Denmark with CW traffic list at 0653. (Boender-Netherlands)

435.0 OST-Oostende Radio, Belgium with a navigation warning in CW at 2130. (Boender-Netherlands)

442.0 UKB-Riga Radio, Russia with RTTY messages in cyrillic at 0900. (Boender-Netherlands)

450.0 FFB-Boulogne-Sur-Mer Radio, France with navigation warnings using CW at 1940. (Boender-Netherlands)

458.0 GND-Stonehaven Radio, UK with navigation warnings using CW at 0840. (Boender-Netherlands)

461.0 PCH-Scheveningen Radio, Netherlands with navigation warnings at 0618 using CW. (Boender-Netherlands)

467.0 OST-Oostende Radio, Belgium with navigation warning in CW at 0622. (Boender-Netherlands)

470.0 DAN-Norddeich Radio, Germany with a general call (DAAD=collective call for all German ships) DE DAN in CW at 2202. (Boender-Netherlands)

474.0 DAN-Norddeich Radio, Germany with a traffic list in CW at 2130. (Boender-Netherlands)

480.0 M/V Paninlen working Oostende Radio in CW at 0735. (Boender-Netherlands)

489.0 UKB-Riga Radio, Russia working an unid ship in CW at 0935. (Boender-Netherlands)

500.0 5 NEI-M/V Andoni working Oostende Radio at 0703 in CW. (Boender-Netherlands) DAN-Norddeich Radio, Germany announcing a traffic list broadcast on 474 kHz in CW at 2130. VAI-Vancouver, BC Canada with a CW V marker at 0630. (Lyttle-BC)

512.0 UOYA-M/V Nefte Rudovoz 47 with a message to Navitankurals with an order for gasoil in CW at 2106 using CW. (Boender-Netherlands)

518.0 Following stations heard here using SITOR-B for NAVTEX broadcast:GCC-Cullercoats, UK at 0850; Oostende Radio, Belgium at 1050; LGP-Bodoe Radio, Norway at 2100; PBK-Netherlands Coast Guard at 1548; and GNI-Niton Radio, UK at 0824. (Boender-Netherlands)

2285.0 Several wierd transmissions noted here in CW as follows: T5RX DE A6DX at 2130; A6DX DE T5RX at 2135; L28X DE 5RSC at 1915; 5RSC DE L28X at 1920; SXGZ DE X5TC at 2110. Each broadcast was followed bt a QTC then short coded messages. (Boender-Netherlands) *Anybody want to take a stab at these-Chief??*

2590.0 Valentia Radio, Ireland working USB telephone traffic for Master-of-Singapore registered ship 9VIT. (Jim-UK)

2849.0 Probable Portuguese Navy RTTY broadcast with messages addressed to CTAB at 2305. (Jim-UK)

3485.0 Gander VOLMET with aviation weather for various locations in Canada in USB. (Stephen Hunter-Drexelhill, PA)

3763.0 Unid RTTY station sending unusual RTTY traffic in columar format at 2200. The first column gave current time ticks followed by other data. (Jim-UK) *Jim that was an unusual logging. Anybody have anything on this frequency-Chief.*

3808.0 Spanish male announces "General Quarters" in English, followed by com motion in Spanish, then silence in USB. South American military? (David Jones-Lawrenceville, GA) *Dunno-Chief.*

4125.0 VAE-Tofino, BC Canada Coast Guard with marine weather broadcast in USB. (Lyttle-BC)

4175.0 DHRG-German ship Alemania Express sending a SITOR-A telexes at 1904. Ship channel 10. (Jim-UK)

4426.0 NMC-USCG Point Reyes, CA with marine weather in USB at 0430. (Lyttle-BC)

5300.0 Canadian forces disaster training network using USB. Nanaimo military transmitted to Victoria, Vancouver and other stations regarding explosions, fires, bridge collapsing, telephone comms down and hospital evacuations. Was this a earthquake? (Jones-GA) *Yea, probably just a drill of comm purposes-Chief*

5394.0 ETD3-AFTN Addis Ababa with calls and RTTY RY test tape. Poor copy at 2105. Also FAX unid station sending some upside-down charts of polar regions. Also saw following: WWEU EDKG MIL WEA ADVY 15C for 15/15000Z to 16/0300Z DTG 15/1445Z. (Jim-UK)

5616.0 TWA 720 working Gander Air at 0248 in USB. (Kevin Carey-Henrietta,NY)

5680.0 Plymouth Rescue working Cul77 (Probably a BAC Nimrod) at 1508 in USB. (Jim-UK)

5696.0 CG 1741 working COMSTA Boston,MA at 1050 in USB. (Carey-NY)

5740.0 HZN-Jeddah Meteo, Saudi Arabia with RTTY Middle-East reports at 2125. (Jim-UK)

5810.0 Shuttle Colombia & mission control, voice relay in USB. (P.G.-UK) *Interesting log, wonder what this is all about-Chief.*

6304.5 UJJA-3400 ton Soviet replenishment tanker Darnitza with traffic for SOVRYBFLOT Moscow (Soviet Fishing Fleet Headquarters) at 0315. Enroute St. John's, Newfoundland for 2200 tons fuel and 100 tons water to replenish SevRyba fleet off Brown's Bank. (Sam Ricks-Philadelphia, PA)

6501.0 NMO-USCG COMSTA Honolulu, HI with marine weather in USB at 0555. Also NMN-USCG COMSTA Portsmouth, VA with marine weather at 0410. (Lyttle-BC)

6509.0 KAW52-Honolulu, HI with sign off announcement at 0604. (Lyttle-BC)

6513.0 VAI-Vancouver Canadian CG Radio working various stations at 1650 in USB. (Lyttle-BC)

6680.0 SAM 26000/86970 (Baker) with Andrews/State Ops routing to Damascus and Air Force One to Greece in USB. (P.G.-UK)

6683.0 SAM 50049 working Andrews at 1719. Then changed call sign to Air Force One, said "Timberwolf is now on board". Requested a continuous phone patch to CROWN for take-off in USB. (Bill Battles-East Kingston, NH)

6693.0 Rescue 5453 working Halifax RCC with a SAR in USB at 1441. (Battles-NH)

6728.0 Numerous F-111 flights operating from either RAF Upper Heyford or Lakenheath working Switchblade Ops (RAF Upper Heyford) or Boweler Ops (RAF Lakenheath). They like to use 6750 a lot also. They go to Scotland for target practice. (P.G.-UK)

6756.0 SAM 60205 working Andrews with a phone patch to Pentagon at 1651 in USB talking about SATCOM problems. (Battles-NH)

6757.0 Carpet Bag (E-4?) working WAR-46 and Acid Man at 0439 in USB with HF signal checks. Heard Air Force One and Carpet Bag next day on 345.5 MHz WFM "Alpha Bravo" phone links. (Battles-NH)

6760.0 J6P working Neatishead testing cypher (scrambler) and clear voice at 0202 in USB. (Battles-NH) *RAF Radar Tracking Net-Chief.*

7275.0 Criminal Investigation Division (Armt or Air Force) showed up in the 40 meter ham band in USB. Ham's tried to contact them and were told to get off their

frequency (sic-Chief). Some of the calls used were Red, Jade, Mars, Attic, Neon-Light, and Tack Command. (Ray Mosteller-Albuquerque, NM)

8063.0 Female in English repeating 'Hotel Kilo' four times then a bizarre little tune was played. Number in German then rebroadcast at 2332 in AM. (P.R.-UK)

8375.0 UISZ-Soviet spaceflight tracking ship NIS Akademik Sergei Korolev with network comms to UZZV Soviet tracking ship NIS Kosmonaut Georgiy Dobrovolski at 2205 in CW. Korolev south of Azores, Dobrovolski returning to position south of Liberia from Las Palmas, Canary Islands. New net frequency as a result of WARC-87, also active at 0305. (Ricks-PA)

8389.5 UMFW-Soviet research ship NIS Professor Zubov with weather and traffic for Leningrad Hydromet Radio (GMS) via RNO-Moscow at 2340. Out bound from Leningrad to Santiago, Cuba. Position 18.7 north and 53.7 west, Mid-Atlantic approaching Lesser Antilles. RTTY 170/50. (Ricks-PA)

8403.0 UTNE-8300 ton Soviet fish carrier Matias Tezen, pendant number MT-0198, with weather for Murmansk Pogoda via URB-2 Klaipeda Radio at 0000. Position 24.8 north 61.6 west. RTTY 170/50. (Ricks-PA)

8404.5 UWVD-2300 ton Soviet "Tarusa" class stern trawling factory ship Verkhovina, pendant number MB-2413, with traffic for Murmansk via URB-2 Klaipeda Radio at 0115. Position 42 degrees 50 minutes north 62 degrees 39 minutes west at Brown's Bank south of Nova Scotia. RTTY 170/50. (Ricks-PA)

8417.0 HEC-Berne Radio, Switzerland with SITOR-B traffic list at 1934. (Jim-UK)

8471.0 NMN-Coast Guard COMSTA Portsmouth, VA with a CQ CW marker. (Gordon Levy-Anaheim, CA) *We need times on your logs Gordon-The Chief.*

8555.0 TBB7-Turkish Naval Radio Ankara with CW marker at 0619. (Jim-UK)

8568.5 XFM-Manzanillo Radio, Mexico with CW marker at 0625. (Jim-UK)

8589.0 HPP-Panama Radio, Panama with CW marker at 0628. (Jim-UK)

8602.0 CWA-Cerrito Radio, Uruguay with CW marker at 0630. (Jim-UK)

8634.0 PPR-Rio Radio, Brazil with CW marker at 0633. (Jim-UK)

8698.0 7TF6-Skika Radio, Algeria with CW marker at 0636. (Jim-UK)

8719.0 USS Mohawk working COMSUBRON 8 at 1824 in USB advising the UGC-48 RTTY was down. (Battles-NH)

8972.0 Fine Art 02 working Blue Star at 0015 with Ops normal message in USB. (Battles-NH) *That's a wierd set of calls for the Navy's Atlantic Safety of Flight channel-Chief.*

9057.0 Samworth, Overgrown and Prompter (EC-135s) on at 0021 with clear voice (USB) and 'Parkhill' (scrambled) voice checks on this frequency designated 'Sierra 309'. (Battles-NH)

9130.0 Israeli Mossad Number station heard at 2209 with English female giving 5-digit number groups. (Fernandez-MA)

9251.0 English female 5-digit number station at 2201 in AM. Also heard a calliope beteen numbers. (Fernandez-MA)

9334.3 AFRTS feeder Croughton, England using LSB at 2156 with literary program, ID at 2200 then news broadcast. (Fernandez-MA)

10505.0 Unid stations 101, 102, 103, 106 and 109 concluding radio checks for the week in USB. (Jones-GA)

11039.0 DDH9-Hamburg Meteo, Germany with calls then traffic using CW at 1847, parallel DDH47 on 147.3. (Jim-UK)

11093.0 Italian Embassy, Cairo Egypt with multi-address 5-letter cipher traffic using SITOR-A at 1750. (Jim-UK)

11176.0 USAF Ascension Island GCCS station with a phone patch to Sigonella, Italy for Medevac 859 about pickup of a critical heart patient in USB at 1900. (Tom Hites-APO NY)

11475.7 HMF52-KCNA news agency Pyongyang, North Korea with English language propaganda sent via RTTY at 1801. (Jim-UK) Heard at 0135 sending FAX. (Donald Nyre-Newport Beach, CA)

12110.0 At 0000 in USB contact between Panama and Galapagos Islands heard arranging scientific tours. References made to classes and passengers arriving Venezuela and Austria. (Jones-GA)

12255.0 5 YD-AFTN Nairobi, Kenya on unlisted frequency with calls and RY test tape using RTTY at 1810. (Jim-UK)

12525.5 EREA-Soviet Hydromet weathership NIS P Musson with weather for RNO-Moscow at 0100. Position 40.7 north 50.6 west. SITOR mode. (Ricks-PA)

12561.0 UZZV-Soviet spaceflight tracking ship NIS Kosmonaut Georgiy Dobrovolski with traffic for URD-Leningrad Radio at 0130. Enroute to Las Palmas, Canary Islands. RTTY 170/50. (Ricks-PA)

12734.0 US Navy combat air patrol (*we call that CAP-Chief*) exercises. Soviet Bear bombers and MIG-23s are IDed and then 'splashed' (*shot down-Chief*) by fighter units overseen by single-letter call sign units (*AWACS? I doubt it probably an E-2C Hawkeye-Chief*). Also on 9257 and IDed as "War Net". (Jones-GA)

12808.5 VTG7-Indian Naval Radio, Bombay with a CW fleet forecast to collective call VWGG. (Jim-UK)

12953.0 Caught the following transmission in CW: "CQ CQ CQ DE VIS VIS/Due to industrial Australian coast stations will not accept telegrams to/from shipping until further notice. Please note, maritime safety (AUSREP/AFZ/OBS), radphone and seatex services currently remain unaffected. Sydney Radio/VIS 1038 UTC X". (Wilfred Gregson, II - Annasdale, VA)

12966.8 A7D-Doha Radio, Qatar with a CW marker at 1603. (Jim-UK)

13011.0 AQP6-Pakistan Naval Radio, Karachi with CW marker at 1554. (Jim-UK)

13042.5 FUV-French Naval Radio, Djibouti with a V CW marker at 1557. (Jim-UK)

13366.5 5YD-AFTN Nairobi, Kenya with RTTY service messsages at 1710. Appears to be a link from Nairobi to Addis Ababa. (Jim-UK)

14325.0 International Amateur Radio Hurricane Net in session with an emergency SAR situation that turned out to be a hoax in USB. Even had Coast Guard units out in a storm checking on this endangering Coast Guards lives. (James Hayes-Ticonderosa, NY) *This is very common James. We have some very sick idiots out there that have absolutely no common sense. I wish the FCC would get off their duffs and bust these nurds-Chief.*

14686.0 Ambush working an unid station for a grocery list in USB. Ambush requested the following: 3 cases of Bud Light, 1 case of Miller Light, 10 frozen steaks, 10 center-cut pork chops, 2 cases of each Pepsi and Coke, case of V8 juice, Vodka, 2 cans of corned beef, 3 cans each of corn & green beans, and some crackers. (Jones-GA) *Yum, Yum, I'm hungry and thirsty, when do we eat Ambush-Chief.*

15962.0 Hardship working Kilogram (EC-135) on 'Sierra 315' at 1519 in USB. Also tried X-908, X-905, W-109 and S-309. (Battles-NH) *Thanks Bill, folks this is a new identifier for your list-Chief.*

16912.0 SUH5-Alexandria Radio, Egypt with a CW marker at 1636. (Jim-UK)

16915.0 FUX-French Naval Radio, Le Port, Reunion Island with a V CW marker at 1634. (Jim-UK)

16950.0 9 MB6-Penang Naval Radio, Western Malaysia with a CW marker at 1629. (Jim-UK)

17037.0 YQI6-Constanta Radio, Romania with a CW marker at 1645. (Jim-UK)

17040.0 NSY-US Navy Catania, Italy sending a FAX 36-hr MED SFC PROG 201200Z chart signed by AG1 Gillespie. (Jim-UK)

17091.0 XSQ4-Guangzhou (Canton) Radio, China with a CW marker heard at 1650. (Jim-UK)

17170.3 ZLB-Awarua Radio, New Zealand heard with a CW marker at 1932. (Jim-UK)

17190.0 D3E71-Luanda Radio, Angola with CQ CW marker at 1624. (Jim-UK)

17940.0 N874TA working Houston Universal at 2106 in USB over Grand Turk enroute Miami. "We are an AMSA flight #384". Anybody know what AMSA is? (Battles-NH)

18040.0 TCY4-AA news agenct Ankara, Turkey with RTTY English language propaganda at 1122. (Jim-UK)

18227.0 Unid Diplomatic stations with lots of 5-figure cipher. No headers. "All QTC5 ALL QTC5 SK". Caught at 1107 using RTTY and off at 1109. (Jim-UK)

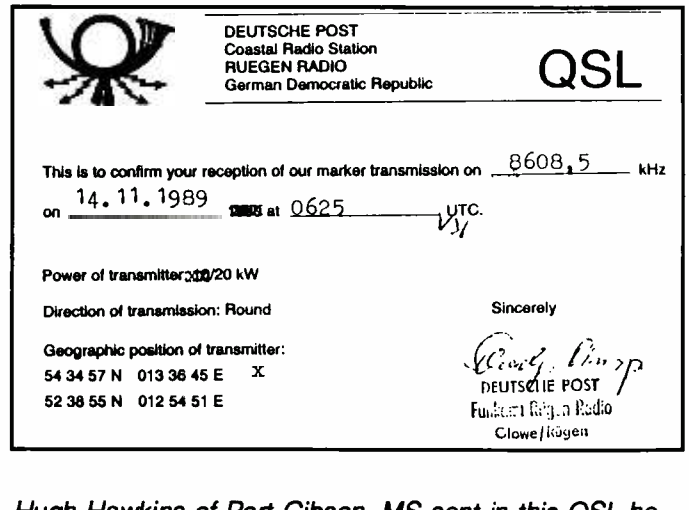
18782.5 VOA Greenville, NC with a ISB broadcast feeder, English on USB and Arabic on LSB at 1943. (Jim-UK)

19282.0 Unidentified UN VFT/RTTY signal sending telegrams (mostly from ILO), wide range of origins and destinations. (Jim-UK)

20390.0 Sentry 61 (E-3) working Cape Radio with phone patch to Tinker AFB at 1451 in USB. Phone patch was the 'Current Ops' at Tinker. (Battles-NH)

20891.0 Cuban Diplomatic RTTY 5-figure traffic for Beijing Embassy at 1103. (Jim-UK)

22967.0 Swiss Embassy Ottawa? Messages in French datelined Ottawa for Paris and Berne. Some off-line encrypted (5-letter groups). At 1613 using SITOR-A. (Jim-UK)



DEUTSCHE POST
Coastal Radio Station
RUEGEN RADIO
German Democratic Republic

QSL

This is to confirm your reception of our marker transmission on 8608,5 kHz
on 14.11.1989 at 0625 UTC.

Power of transmitter: 10/20 kW

Direction of transmission: Round

Geographic position of transmitter:
54 34 57 N 013 36 45 E X
52 38 55 N 012 54 51 E

Sincerely

DEUTSCHE POST
Funkstelle Rügen Radio
Clowe/Rügen

Hugh Hawkins of Port Gibson, MS sent in this QSL he received from Deutsche Post, Coastal Radio Station.

The Scanning Report

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

Active Scanning

During the past few years, the hobby of scanning has been changing. Scanner buffs are no longer content with passively sitting behind their radios. Scanning has become a fast paced, high tech deterrent to crime. Scanner enthusiasts are using their scanner radios to help their local police to apprehend criminals and to render aid in medical emergencies. This new breed of scanning is called "active scanning," and its popularity is quickly sweeping across the nation.

In Virginia Beach, a scanner buff monitored and taped a cordless phone call between two burglars. The police used the tape to obtain a search warrant that lead to the arrest of the two individuals. When a scanner buff in Maine reported the weak distress call from a sinking boat, he was credited with saving the lives of the crew. The most famous incident occurred when a scanner buff made a tape recording of the radio communications at the Seabrook Nuclear Power Plant in New Hampshire. The contents of the tape raised serious concerns about nuclear safety.

Have Scanner, Will Travel
Thinking about running out and getting actively involved in something you heard over the scanner? Better think again.

Active scanning can be a lot of fun, but it's not for everyone. Few people realize that active scanning is accompanied by its own unique set of problems. If you're thinking about participating, here is a sampling of the scenarios that you may encounter.

Imagine for a moment that you're monitoring the cordless phone band. Suddenly, you discover that your neighbor is using his cordless phone to run an illegal gambling operation. What would you do? Will you call the police? Or will you reserve your response for a more serious crime? If you do choose to call the police, are you prepared to face the legal proceedings that may accompany your decision?

And what about cellular car phones? Will the Electronic Communications Privacy Act, which prohibits cellular monitoring, prevent you from recording cellular conversations? If not, are you willing to face a possible court battle by revealing information that was gathered in violation of the ECPA?

Are you thinking about monitoring the public service bands? Planning to help your local police to catch criminals? At first glance, it seems fairly safe. You simply listen to your scanner radio and keep the police informed by telephone. But what will happen if your phone call actually leads to the apprehension of a criminal? Would you be upset if your local newspaper published the incident?

At this point, I know what you're thinking. "Can you become involved with active scanning and maintain your anonymity?" The answer to that question is a resounding, No! You can't have the best of both worlds. If you want to scan in complete privacy, don't become involved with active scanning. As I've already mentioned, it's only a matter of time before your active scanning endeavors become a matter of public record.

Don't be fooled into believing that your home telephone can protect your privacy. Several years ago, that may have been true. In today's computer enhanced society, it's becoming increasingly difficult for a caller to withhold his or her identity. In many areas, law enforcement agencies are using high tech telephone equipment that automatically displays the callers phone number.

If you choose to respond in person to a monitored emergency, use an extreme amount of caution. The possible legal problems that can accompany such a response are staggering. If you render aid in any form, you risk the possibility of a law suit. Here's a classic example: You arrive at the scene of an auto accident. An occupant in one of the vehicles requests that you help him to exit his car. Several weeks later, you discover that you have been named in a law suit. The person that you assisted is claiming that you aggravated his injury.

Don't get the wrong idea. I'm not trying to scare you away from active scanning. My intentions are to merely make you aware of the additional responsibilities that are associated with this aspect of the hobby. If you can handle the accountability and commitment that accompany active scanning, then go for it! If you don't want to get involved, that's okay, too.

As a scanner buff, you're not obligated to respond to a monitored emergency. In fact, it's perfectly legal (and preferred by some law enforcement agencies), if you do nothing more than listen. The final decision is entirely up to you. Take your time, think about it, and choose wisely.

Treasure Hunt

In a few weeks the holiday shopping season will begin. And as most of you know, the scanning action will become red hot. If you've been wondering how to complete your holiday shopping without missing the scanning action, I've got the perfect answer. It's a battery operated, pocket size, tape saving device. The "Scan Record," is a small, black case, about four inches long, two inches wide, by two inches deep. The front panel incorporates a dial control for adjusting sensitivity, a red LED indicator, and a toggle switch for controlling the delay time.

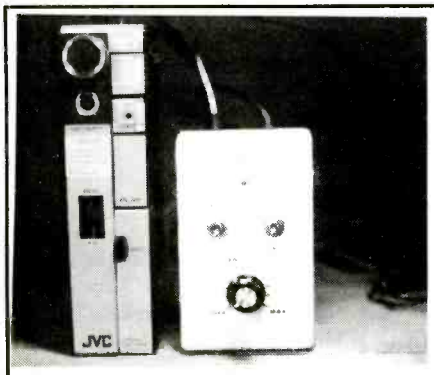
One of the unique features on the Scan Record is the addition of an A/B switch that totally eliminates the need to remove the control cable from the recorder. Simply flip the switch, and the tape player can be manually operated.

The absence of a mechanical relay is another pleasant surprise. The solid state switching components are completely silent—a nice feature if you're making a recording in the same room where you are sleeping.

With a 9 volt battery installed, the Scan Record becomes completely portable. With a hand held scanner and battery operated tape recorder, it's easy to make recordings at emergency scenes, air shows, or during camping trips.

The Scan Record does not have an internal speaker or volume control. If you want to hear the action while recording, a dual-jack adapter with an ear phone, or extension speaker can be attached in minutes.

The Scan Record is manufactured by Capri Electronics, 1238



A nifty time-saver and tape-saver, the "Scan Record" is the Treasure Hunt prize for November and December.

Highway 160-B, Box 589, Bayfield, Colorado 81122. Retailing for $47.00 dollars, the unit is attractive, well built, and reasonably priced. In my opinion, it's the best tape saver on the market!

Capri Electronics has provided two Scan Records that you can win. Simply send in your answers to the following questions, and keep your fingers crossed. All the answers can be found in the October 1991 issue of *MT*.

1. What is a Shinwa SR001?
2. On what page can you find the words: Silk Purse Scrapped.
3. If you order a CPL-63 from Grove, what will you get?
4. The longer the antenna, the lower the frequency. True or False?
5. Provide the transmission mode for aircraft communications.

Send your answers to the Treasure Hunt, P.O. Box 98, Brasstown, NC 28902. You can enter as often as you like, but each entry must be mailed separately. Post cards are encouraged. FAX entries will not be accepted. Good luck!

Frequency Exchange

Anyone care to visit the ***Yukon Territory*** of Canada? If you don't like cold weather, that's okay. Grab a seat near the fireplace and listen to the following frequencies:

138.630	Royal Canadian Mtd Police	167.850	Air Canada
138.720	"	168.825	US Border Patrol
140.100	"	172.250	Army Prevost
140.130	"	440.800	CTV Mobile News
143.415	Highway Crews	451.100	Museum Security
143.535	RCMP Coast Guard	452.875	Loomis Armor Truck
151.475	Federal Prison	461.100	Pt Angelis Police
164.080	Forestry Fire	473.475	Road Crews (Victoria)

The above frequencies were provided by Ronald Tull. Ron's complete listing for the Yukon provides frequencies for the following areas: Whitehorse, Smithers, Prince Rupert, Sparwood, Prince George, Abbotsford, Salmo, Fruitvale, Nelson, Castegar, Jasper, Cold Lake, Edmonton, Toronto, Hamilton and several others.

If you need the frequencies for any of the above, send a #10 SASE to the Frequency Exchange, P.O. Box 98, Brasstown, NC 28902.

Was it too cold in Canada? Want to go south? Let's try ***Brooklyn, New York***. The following frequencies were provided by Joseph Finocchiaro.

151.290	Parks Dept.	155.535	NY Corrections
151.310	"	155.565	"
151.350	"	160.845	Coney Island Transit
151.625	Air France	172.400	Police,Central Park
151.655	Macys Dept. Store	450.0875	TrafficChopper,WCBSNews
151.955	Waldorf Hotel	450.1375	Shadow Traffic
154.600	Sanitation Police	453.3750	JFK Airport Crash Crew
154.845	Midstate Corr. Facility	453.850	Snow Control, Nassau Cty.

What did you say? New York isn't your idea of going south for the winter. Looking for a warmer place to stay? Let's try ***Hilton Head, South Carolina*** (anonymous submission).

151.655	Port Royal Plantation Security
151.685	Moss Creek Plantation Security
151.955	Palmetto Dunes Plantation Security
460.225	Beaufort County Sheriff
460.275	South Carolina Highway Patrol
460.30	Beaufort County Sheriff

Are you still complaining about the cold? Okay, here's the best that I can do. Welcome to ***Broward County, Florida***.

153.83	Broward County Community College
468.175	Fire Dispatch
471.0375	Fire Talk Around
154.54	Hurricane Shelters
154.57	Hurricane Shelters
44.96	Marine Patrol
45.00	Marine Patrol
45.06	Marine Patrol, co-ordination with other agencies
161.16	Parks & Recreation
453.575	Turnpike Patrol
453.625	"
453.675	"
453.725	"

Our visit to Broward County, was provided by Mike Kantor. If you're nice and warm, I suggest that you grab a coat. A scanner buff, known as "Dale," has just invited everyone to a scanner party in ***Harrison County, West Virginia.***

39.68	Harrison County Sherriff
42.10	State Police
42.12	State Police
42.26	State Police
46.14	Volunteer Fire Dispatch
46.20	Volunteer Fire Dispatch
72.36	State Police, mobile repeater
72.92	State Police, mobile repeater
72.96	State Police, mobile repeater
75.90	State Police, base repeater
75.98	State Police, base repeater
156.00	EMS Dispatch

In return for providing the above frequencies, Dale has one request: Does anyone have the Bridgeport, West Virginia, UHF frequency? Dale monitored a police officer reporting that his UHF radio wasn't working. According to Dale, no UHF frequency is listed.

If you want to invite the Frequency Exchange to your town, send a list of your local frequencies to the Frequency Exchange, P.O. Box 98, Brasstown, NC 28902.

Computer Corner

What is your favorite frequency management program? In the September issue of *MT*, I gave away a software program that could store and sort frequencies with only a minimal amount of user input (sorry, the offer was for a limited time). If you're using a program that you enjoy, and if it's not copyrighted, send it in. I promise to share the good stuff with everyone. Be sure your postage is adequate for the weight of your package; we shelled out a lot of bucks on insufficient postage in the last two months.

Did you purchase one of those mega buck programs that promises to control your scanner radio? Did the program work as advertised? How long did it take for you to become familiar with the program? These are the types of questions that your fellow scanner buffs are asking.

Since I can't personally try all the programs that are on the market, I need your help. If you have purchased a scanning related software program, I'd like to hear from you. Send your comments and suggestions to the Computer Corner, P.O. Box 98, Brasstown, NC 28902. In a future column, I'll use your responses to provide a list of products that offer the best deal for your money.

Reader Response

In my August column, a reader named Brian complained that he could not monitor the Seattle Police when they went to the "Blue Dot" frequency. Many of you wrote and suggested that the Seattle Police could be using the itinerant frequency of 154.57.

As most of you know, there are several manufacturers of off-the-shelf transceivers that transmit on the itinerant frequencies. Here are a few of the more common frequencies and color designators:

151.625	Red Dot	464.50	Brown Dot
154.57	Blue Dot	464.55	Yellow Dot
154.60	Green Dot	167.73	Black Dot

Would it be legal for the police to use an itinerant frequency? Has anyone monitored the Seattle Police, or any police department on an itinerant frequency? Send your comments to the Scanning Report, P.O. Box 98, Brasstown, NC 28902.

Cellular Switching

A scanner buff in Lansing, Michigan, wrote in and asked why some of his cellular calls cut off in mid-sentence. He wanted to know if something was wrong with his scanner radio.

If you're experiencing a similar problem, relax. There's nothing wrong with your radio. Cellular telephone systems are computer controlled. The computer has the ability to "hand off" the conversation to another cell, (frequency). Here's an example: If the original cell is filled with callers, and if a channel becomes available on a cell closer to the moving vehicle, the call is handed off to a new cell on a different frequency. This accounts for the sudden loss of signal on a scanner radio.

Everyone is reminded that the Electronic Communications Privacy Act prohibits the monitoring of cellular phone calls. You can listen in for experimental reasons, but you can't sit on the band and actually monitor cellular calls. If you don't want to get into trouble with the "Cellular Police," here are the bands to avoid: 870.00 to 890.00 megahertz.

Police Call

It doesn't matter if you're looking for one specific frequency or a hundred frequencies, the best place to look is in *Police Call*. Published by Gene Hughes, you can find *Police Call* in your local Radio Shack store.

If *Police Call* doesn't provide you with the exact frequencies, you may simply need to do a little homework. Here's an example of how *Police Call* has helped me. I was looking for the "speed trap" frequency of my local police. *Police Call* listed my local police frequency as 45.54 megahertz. To find the speed trap frequency of 45.90, I simply searched between 45.00 and 46.00 megahertz. Get the idea? Use *Police Call* as a reference source. Pull out the frequency ranges, and search them. Try it!

Next Month

Can you believe that Christmas is less than a month away? When you're out there shopping, look for me in the Mall. I'm the guy with the antenna in his hat!

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(*Excludes Cellular)

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BEARCAT BC70XLT	129.99	(7.00)
BEARCAT BC100XLT	189.99	(7.00)
BEARCAT BC140	94.99	(7.00)
BEARCAT BC142XL	94.99	(7.00)
BEARCAT BC147XL	99.99	(7.00)
BEARCAT BC172XL	139.99	(7.00)
BEARCAT BC177XL	139.99	(7.00)
BEARCAT BC200XLT	269.99	(7.00)
BEARCAT BC205XLT	259.99	(7.00)
BEARCAT BC210XLT	169.99	(7.00)
BEARCAT BC310A	85.99	(7.00)
BEARCAT BC330A	109.99	(7.00)
BEARCAT BC400XLT	99.99	(7.00)
BEARCAT BC560XLT	109.99	(7.00)
BEARCAT BC600XLT	199.99	(7.00)
BEARCAT BC760XLT	269.99	(7.00)
BEARCAT BC800XLT	249.99	(7.00)
BEARCAT BC855XLT	199.99	(7.00)
BEARCAT BC950XLT	249.99	(7.00)
REGENCY R3020	96.99	(7.00)
COBRA SR901	74.99	(6.00)
REGENCY R4010	106.99	(7.00)
MIDLAND CB Radios	*In Stock*	
COBRA CB Radios	*In Stock*	
UNIDEN CB Radios	*In Stock*	
Two-Way Radio Batteries	*In Stock*	
Scanner Antennas	*In Stock*	
Power Supplies	*In Stock*	
RELM RH606B	414.99	(9.00)
RELM UC202 (2 or more)	129.99	(6.00)

SCANNER ACCESSORIES

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BCAD100	14.99	MA917	24.99
BCAD140	14.99	MA518	14.99
BCAD 580	16.99	MA501	14.99
BC003	7.99	ESP25	16.99
BC002	59.99	GRE8002	79.99
PS001	12.99	GRE-HH	54.99
UA502A	12.99	GRE9001	89.99
BP205/200	34.99	GRE 3001	62.99
BP70	16.99	FBE	4.00
VC001	12.99	FBW	4.00
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Grundig Yacht Boy 220	106.99	(5.00)
Grundig Cosmopolit	198.99	(7.00)
Grundig Yacht Boy 230	149.99	(5.00)
World Radio & TV Handbook (1991)	18.99	(*)

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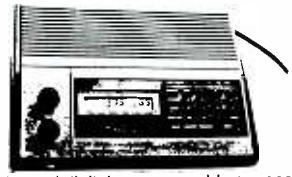
Features include: 10 programmable channels, one touch memory programming, external speaker jack, 29-54 MHz, 136-174 MHz, 400-512 MHz, squelch, lockout, full frequency digital readout, AC or DC operation, retains memory up to 3 days without power, scan button. Includes AC adapter, telescopic antenna, and complete operating instructrions. Size: 7¼" W x 2" H x 7¼"D. One year factory warranty.
(Optional mobile cigarette lighter cord #901MPC **$4.99**)

Regency R3020

$96.99 *($7.00 Shipping)*



20 channel digital programmable scanner, frequency coverage 29-54 MHz, 108-136 MHz aircraft, 136-174 MHz, 406-512 MHz. Features: weather key, search, lockout, priority, squelch, AC only, delay button. Size 9½"x2⅜x7".

(Limited Quantity of R3020 Available)

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$249.99 *($7.00 shipping)*

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

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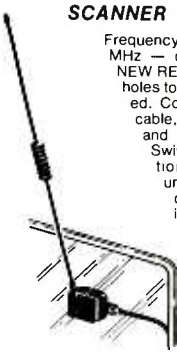

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what's new?

Larry Miller

Taking the Big Boys On the Road

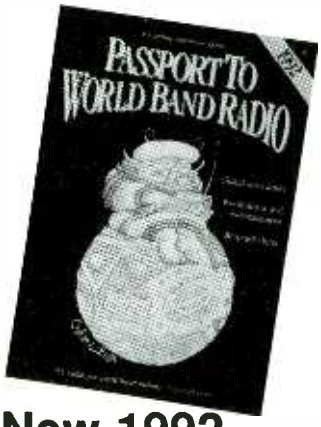
It's a sad fact of life. Not every radio comes with a 12 volt jack in the back. So unless your receiver is designed for mobile use, it's useless when it's away from the 120 volt AC in your home.

For everyone who has ever wanted to take a non-mobile scanner with them in the car; for everyone who has ever wanted to turn their desktop shortwave receiver into a mobile unit, there is an answer. It's called the PowerStar 200 Inverter.

An inverter is a device that enables a low-voltage DC storage system (like a car battery) to run standard 110 volt AC appliances. The PowerStar 200 is about the size of a double deck of cards. On one end is a plug that goes into the cigarette lighter in your car. On the other end is a standard wall outlet-type socket that produces 140 watts of 110 volt of AC power. You just plug your radio into the PowerStar 200 and listen anywhere.

The PowerStar 200 isn't a battery killer, either, drawing only 0.25 amps (3 watts) at idle.

The PowerStar 200 is $149.00 plus $11.00 shipping from Real Goods, 966 Mazzoni St. Ukiah, California 95482. You can also order toll-free at 1-800-762-7325.



New 1992 Passport

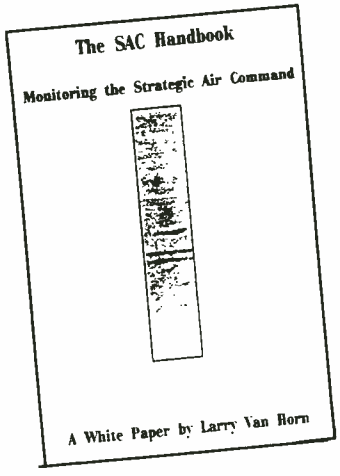
Larry Magne's new 1992 *Passport to World Band Radio* is off the press and on the street. This year's edition of the leading shortwave annual is slicker, more consumer oriented. The cover—a daring move in the often stodgy world of shortwave—features an original drawing by cartoonist Gahan Wilson. (See picture, above.)

There is the traditional "Buyer's Guide," 171 pages of by-frequency listings for identifying those weak, hard-to-hear stations, along with predictable profiles of the Top Ten Shortwave Programs for 1992, and articles on "Getting Started," "How to Buy a Shortwave Radio," and "20+ Big Signals."

This year, however, marks the addition, or beefing-up of three sections—"What's on Tonight?" (similar to the program section in *Monitoring Times*, "Worldwide Broadcasts in English" (arranged by country), "Voices from Home" (foreign language broadcasts arranged by country) and,—new for '92—a fairly comprehensive listing of station addresses (the only thing that the *World Radio TV Handbook* had over *Passport*.)

The new consumer-oriented appeal of the 1992 *Passport to World Band Radio* should not put off hard-core listeners. The book is still every bit as useful, if not more so, with the station address list than before. And fear not, there are still appealing Magneism's like using the phrase *ad alta voce* to describe a program.

In all, the 1992 *Passport to World Band Radio* is a useful, information-packed, fun book that should be front and center in every radio room. It's available for about $16.95 from a wide range of *MT* advertisers.



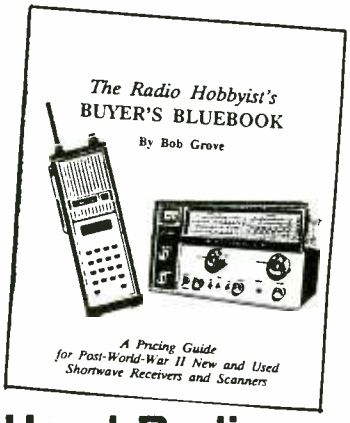
Monitoring the Strategic Air Command

The mission of the Strategic Air Command (SAC) is clear: nuclear deterrence and, should that fail, nuclear retaliation. SAC is an incredible collection of men, women and machines that controls two thirds of the United States' nuclear triad. It is this organization that sends out the nuclear-armed bombers; SAC that launches the Intercontinental Ballistic Missiles.

Not unpredictably then, few organizations provide the radio listeners with the excitement of the Strategic Air Command. Active on all bands, from low frequency to shortwave to scanning and above, there is virtually something for everyone with a radio to hear. *Monitoring Times'* popular "Utility World" author Larry Van horn has produced an authoritative, 50+ page 8-1/2 x 11" *SAC White Paper: Monitoring the Strategic Air Command.*

In it Van Horn gives insight into the operation of the organization, its communication systems and various networks (like "Giant Talk"), frequencies for both shortwave and scanner listeners, help on understanding what SAC communications mean, and five appendices that provide a glossary of terms, a list of bases and airports, and the most comprehensive list of SAC callsigns to be found anywhere.

The SAC White Paper: Monitoring the Strategic Air Command is available from DX Radio Supply for $12.95 (check or money order only) plus $1.35 book rate shipping or $2.60 UPS. The address is P.O. Box 360, Wagontown, PA 19376.



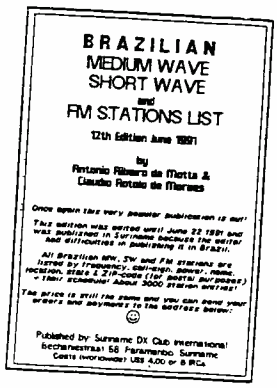
Used Radio Buyer's Guide

Most radio enthusiasts seem to keep an arm's length from used equipment. Unless you get to see the equipment up-close or buy from a reputable firm, purchasing a used radio can be as risky as putting all your money in rubles. Never one to dodge a challenge, Bob Grove has prepared a new book that, while it won't guarantee that the piece of used equipment you buy will work, will at least enable you to go to bed at night knowing that you didn't pay too much.

The Radio Hobbyist's Buyer's Bluebook is billed as "A Pricing Guide for Post-World-War II New and Used Shortwave Receivers and Scanners." It's perfect for taking along on trips to hamfests and flea markets.

Divided into two sections—Solid State Receivers and Scanners, and Vacuum Tube Shortwave Receivers—it shows the unit's original retail price, and then suggests a reasonable used resale price.

Interested in picking up a Sony '2010 (original retail $279.00)? Expect to pay $200 for a used one. Or how about a Whippany "Lil Lulu" (original retail $250.00)? A used one is just $50.00. The 33-page, pocket-size *Buyer's Bluebook* is available for $5.95 plus $1.00 first class postage from Grove Enterprises, P.O. Box 98, Brasstown, NC 28902.



Brazilian Shortwave List

The Suriname DX Club International has published its annual *Brazilian Medium Wave, Shortwave and FM Stations List*. This is usually a top-notch list for those who chase rare Brazilian DX. Unfortunately, the author apparently forgot to send an actual copy of the publication for us to see, so all we can tell you is what the publisher says about the list: "All Brazilian MW, SW and FM stations are listed by frequency, call-sign, power, name, location, state (for postal purposes) and their schedule. About 3,000 station entries!"

You can get yours for $4.00 or 8 IRCs from the Suriname DX Club International, Bechaniestraat 58, Paramaribo, Suriname. Be careful sending cash to Suriname.

Radio and Earthquakes

Monitoring Times reader Vince Migliore has launched a new newsletter called *Geo-Monitor*. *Geo-Monitor* examines Ultra Low Frequency (ULF) electromagnetic radiation, magnetic fields, animal behavior and human physical symptoms, to try and unlock the mysteries of the earth.

The publication is fascinating, superbly edited and very engaging. There are articles on using radio to predict earthquakes, projects to buy or build that can monitor geophysical activities, reports on related phenomenon such as "Crop Circles" (unexplained patterns of crushed crops in farm fields) as well as detailed charts of recent earth activity.

Geo-Monitor is a great read and comes highly recommended. Sample copies are $2.00; subscriptions (12 issues) $18.00. Vince's address is 1055 West College Avenue, Suite 321, Santa Rosa, CA 95401.

1992 World Press Service Frequencies

If you have a shortwave demodulator for decoding RTTY, this popular news frequency directory by Thomas Harrington is a must! The all-new 1992 edition is cross-referenced by time, frequency and location, and lists approximately 400 frequencies and dozens of agencies which may be heard on RTTY and other modes throughout the shortwave spectrum.

Additional chapters list abbreviations and explain about equipment, accessories and tuning tips. *World Press Services Frequencies* is $8.95 from Universal Electronics, 4555 Groves Rd., Suite 3, Columbus, OH 43232 and other *MT* advertisers.

Liable to Libel?

Invasion of privacy litigation is increasing in the United States; while 80% of the plaintiffs win in court, 75% of the verdicts are overturned on appeal. This is an expensive and time consuming process.

Attorneys, publishers, and other mass media are well advised to consider ordering the 1000-page second edition of Libel and Privacy by Bruce W. Sanford. This enormous reference is divided into 17 sections; the first part advises the reader how to prevent libel situations, while the second assists in litigation should a case of libel or invasion of privacy arise.

Author Sanford, a leading First Amendment lawyer, approaches the matter in an easy-to-read, four-step process for journalists to follow. An extensive catalogue, with assessments, on the subject of "public person" is presented.

Topics covered in the

chapters include a history of defamation, slander and libel in newsgathering, injury to reputation, opinion vs. fact, establishing truth, determination of a public vs. private person, common law damages and the Constitution, privileges, the rights of privacy and publicity, and description of litigation.

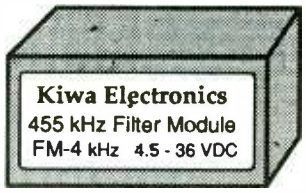
The price tag of $95 will deter any but the most serious student of communications case law, but those who require such aid will find Libel and Privacy an exhaustive and comprehensive reference work. Order from Prentice Hall Law and Business, 270 Sylvan Avenue, Englewood Cliffs, NJ 07632, or if by credit card, call 800-223-0231.

New Opto Frequency Counter

It's called the "Handi-Counter Model 2300" and it's Optoelectronics' newest frequency counter. It features full eight-place readout resolution, 10 mv sensitivity for signal detection at maximum distance from the transmitter, and a unique and convenient display-hold switch so the user won't have to remember to write down the detected frequency.

According to a company spokesperson, "This new Handi-Counter is the most sensitive and sophisticated product on the market for under $100.00. This is a very high quality product."

Opto's new model 2300 Handi-Counter is priced at $99.00 each. Optional NiCad battery pack is 29.00. For more information, call 1-800-327-5912.



455 kHz IF Filter Modules

Kiwa Electronics is now offering an assortment of 455 kHz IF filter modules. These IF filter modules are specifically designed for the shortwave enthusiast who wants improved selectivity from their tabletop or portable receiver. Each filter module includes special input and output amplifiers eliminating the need to match the filter to the receiver's circuitry. Miniature coax for signal connections and self-adhesive velcro pads allow replacement of the filter anywhere within the receiver's enclosure.

Various bandwidths are available from 2.2 kHz to 6 kHz, with excellent shape factors and zero insertion loss. Each filter is $40.00 plus shipping and handling. For more information contact Kiwa Electronics, 612 S. 14th Ave, Yakima, WA 98902 or call 509-453-KIWA.

Heavy Duty Multimeters

Philips ECG has introduced two new hand-held, heavy-duty digital multimeters. The DM-78 and the DM-305 are sealed to resist water and will withstand drops from 5 feet. Both meters are full function with hi-energy fusing and overload protection.

Basic DC accuracy is within 0.5% and AC accuracy is within 1.25% from 40 Hz to 500 Hz. DC and AC current measurement capabilities extend to 20 amps with resistance measurement to 20 megohms. To locate the nearest Philips distributor, call toll-free, 1-800-526-9354.

New Lightweight Cellular Phone

Radio Shack has introduced a new, compact handheld cellular phone called the Tandy CT-302. The CT-302 combines design simplicity in a lightweight package (15.9 ounces with battery installed!); the phone measures just 7 x 2.6 x 1.2 inches—about the size of a pocket stereo player. The CT-302 has 832-channel capacity, an illuminated LCD display with backlighted controls for ease of operation, one-touch last-number redial, scratch-pad memory, signal strength and status indicators and more.

The Tandy CT-302 retails for $499 and comes with rechargeable battery, desktop charger and convenient carrying case.

New Economy-Priced Cellular Antenna

Antenna Specialists has introduced an economically-priced, fast-install, 3 dB gain on-glass cellular mobile antenna. Called the APD853.3, the new high-performance 824-896 MHz optimized collinear-element antenna is power-rated at 10 watts. For complete information, contact Antenna Specialists at 216-349-8400.

New Owner for Yearbook

Broadcasting Yearbook, that venerable—and very expensive—guide to radio, TV, cable and related industries, has changed hands. The telephone directory-sized book was picked up by the R.R. Bowker Company (121 Chanlon Road, New Providence, New Jersey 07974) in a deal that also included *Broadcasting Magazine*. The next edition of the *Yearbook* is expected to hit the streets in early 1992.

Ho, Ho, Ho! Catalogues Ready to Go

Christmas is so close that you could hit it with a rock. So it's no surprise that there are a number of interesting catalogues beginning to fill the mailboxes of radio enthusiasts everywhere. In addition to *Grove Enterprises'* catalog due November 1st with lots of neat new stuff (call 1-800-438-8155), two of the radio industry's giants also have new catalogues.

Electronic Equipment Bank (or "EEB," as it is affectionately known) of Vienna, Virginia, has their giant catalogue of shortwave receivers, scanners and accessories in the mail at this time. If you are not already on their mailing list, call their toll-free number (1-800-368-3270) and they'll be happy to add your name. *Universal Radio* is also preparing for Christmas and their new 92+ page catalogue will be shipping at the end of this month. The catalogue is free by 4th class mail or $1.00 if you want first class delivery. Use their toll-free number, 1-800-431-3939, to get on that list or write 1280 Aida Dr., Reynoldsburg, Ohio 43068.

Marlin Jones and Associates is a Florida-based supplier of electrical components of interest to the do-it-yourself hobbyist. Here you'll find everything from power supplies, switches, test equipment and connectors. To get their catalogue, call 407-848-8236.

We mentioned the *Radio Works* catalogue back in June, but they, too have a new edition out. It's ham-oriented, focusing on antennas and baluns. If you want it by first-class mail, you'll pay $2.00 for this one. If you're willing to wait, give them a call and they'll put you on their mailing list for free. Their number is 804-484-0140.

Doyle Communications offers an 18 page catalogue that includes a selection of radio books, TV, VCR and CD repair books, 800 MHz converters and adapters. It is $1.00 (refundable if you buy anything) from Route 8, Box 18, Lake Pleasant, NY 12108.

Real Goods is a company specializing in alternative energy. Their catalogue is chock-full of things that can easily be adapted to radio use. (See "Taking the Big Boys on the Road.") Call 1-800-762-7325 and ask to get on their mailing list.

Edmund Scientific is a company that produces a catalogue filled with a wondrous array of goodies—from lasers to video microscopy to telescopes, giant magnets, solar equipment and frog hatchery kits. It may not have a lot to do with radio but it sure is neat stuff. You might try calling 609-573-6250 and ask to get on their mailing list or you can write them at 101 E. Gloucester Pike, Barrington, NJ 08007-1380.

If your company has a catalogue that's not featured, send it in! We'll be happy to take a look at it and announce it in *Monitoring Times*' "What's New" column.

Federal Frequency Correction

In September we mentioned that the Bearcat Radio Club offers federal frequency lists to non-members for a nominal charge. This is true; however, we did not have a correct list of states for which the service is available. Federal frequency lists are available for Alaska, Arizona, the District of Columbia, Hawaii, Maryland, New Mexico, Ohio, Tennessee and Virginia. Each list costs $3.00 (plus a self-addressed stamped envelope) from the Bearcat Radio Club, P.O. Box 291918, Kettering, Ohio 45429. We apologize for any inconvenience.

"Uncle Skip" Arey, WB2GHA

Mr. R.F.'s Magical Mystery Tour

Remember the old story about the Ant and the Centipede? For those of you with a significantly deprived childhood, I shall reiterate.

One day Mr. Centipede was walking along minding his own business when his path crossed that of Mr. Ant. "Why, hello there, Ant," said Mr. Centipede. "Howdy, Mr. Centipede," called the ant, "I have been meaning to ask you a question." "Ask away," replied Mr. Centipede.

The ant rubbed his antenna together and spoke. "I have been wondering, you have so many more legs than I do. How do you manage to walk without getting all confused?"

"Why, I don't know," replied the centipede "I never gave it much thought." "Oh well," said the ant "Just thought I'd ask." And the ant went on his way.

Smiling as the ant passed by, the centipede went to step off down the road. He could not move! He was frozen on the spot! Now that he was trying to think about how to walk, he could no longer take even a single step. And there on that spot he stands to this very day, trying to get even one of his hundred legs to move.

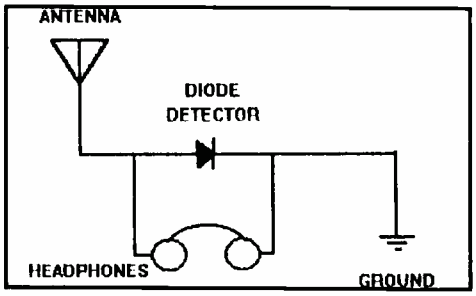
OK, Cut the story time, Uncle Skip!

Sorry boss, just trying to make a point. Many radio monitors, especially beginners, listen to their receivers every day and never give much thought to just how the dingus works. Consider for a moment . . . Radio waves travel from far lands, arrive at your receiver, where they are magically turned into sounds coming out of the speaker. No doubt this process is so strange and complicated that any attempt to understand it without years and years of electronics training will leave a soul frozen in place like old Mr. Centipede, hopelessly confused.

Not so Old Son! Uncle Skip is here to give you the straight scoop on how that receiver of yours works. You may not come away with enough information to allow you to build one, but you will sure know enough to make you a better monitor.

Begin at the Beginning

First, let's take a look at how the signal gets to the receiver in the first place. Way over on the other side of the planet, the folks at Radio Free Freedonia fire up their transmitter for another evening broadcast of The Report of Annual Belly Button Lint Production in Freedonia. The transmitter puts this program out through the air in the form of ELECTROMAGNETIC WAVES. These waves make up the RADIO FREQUENCY ENERGY that bounces off the atmosphere and heads back down toward your receiver.



A diode "crystal" set is the most basic receiver in the world.

Due to a series of physics and electronics principles most simply described as *"There ain't no such thing as a free lunch,"* this signal is whittled down to a few MICROVOLTS. A microvolt is one millionth of a volt. When you realize that the energy used to light the average flashlight is around six volts, you get an idea of just how tiny that signal from Radio Freedonia actually is by the time it gets to your house.

The real magic comes in the form of the receiver. This magic box on your table top takes this eensy teensy signal and nurses it up to an audio signal, the sound you hear coming out of your speaker. But this is not magic, it is science!

How Simple Can You Get?

The simplest receiver is constructed with only four parts. A diode, a set of headphones and two pieces of wire, one for the antenna and one used to ground the system. In the presence of a fairly strong signal the diode will DETECT the electromagnetic energy. The detector serves to RECTIFY (convert) the radio signal, changing it from radio frequency energy into electrical current that is in the audio frequency range. This current then excites the elements of the headphones and sound comes out. Early receivers were little more than a piece of crystal, used as the detector. Talk about *rock* music!

Over time, the concept of radio frequency detection evolved into what we now know as a receiver. All the additional parts, dials, bells and whistles allow you to hear more signals and have an increasing amount of control over them once they are "detected" by your receiver.

In the simple one diode receiver I described, the radio frequency energy itself drives the headphones, creating the sound. Needless to say, if you are using energy that is a million or so times less than that of the average flashlight you are not going to hear very many far away stations. The development that allowed us to move into the world of the modern receiver was AMPLIFICATION.

There are many different kinds of amplification circuits used for hundreds of purposes in the world of electronics. Essentially they all do the same thing, though. They take the original signal and boost it by adding more energy to it from a locally supplied source.

Most receivers you will encounter (unless you are an avid collector of antique crystal sets) will have amplifiers ahead of the detector circuit, increasing the incoming radio frequency signal, and after the detector, boosting the rectified audio signal.

We can get a better handle on this notion if we follow a radio signal through a simple receiver and out of the speaker. Get comfortable; it's story time again.

The RF Amplifier

Mr. Radio Frequency Energy has just arrived at the antenna. He is plum tuckered out from his journey half way around the world. Weak and wimpy, the radio signal is still able to create a small electrical current as it hits the antenna. This current travels down the antenna lead-in and enters the first stage known as THE RADIO FREQUENCY AMPLIFIER. Three guesses what this does.

This stage takes the RF signal and pumps it up, sort of like taking our 98-pound weakling, putting him through the gym and turning him into Arnold Schwarzeneger. The difference is, the process occurs at the speed of light!

The Mixer

"Way back in the early development of radio receivers, it was discovered that you could amplify the RF energy more efficiently if you were to lower the frequency. The creative solution to this was the MIXER stage. This stage takes the signal that has just come through the radio frequency amplifier and (you guessed it) mixes it with the signal from a circuit called the LOCAL OSCILLATOR.

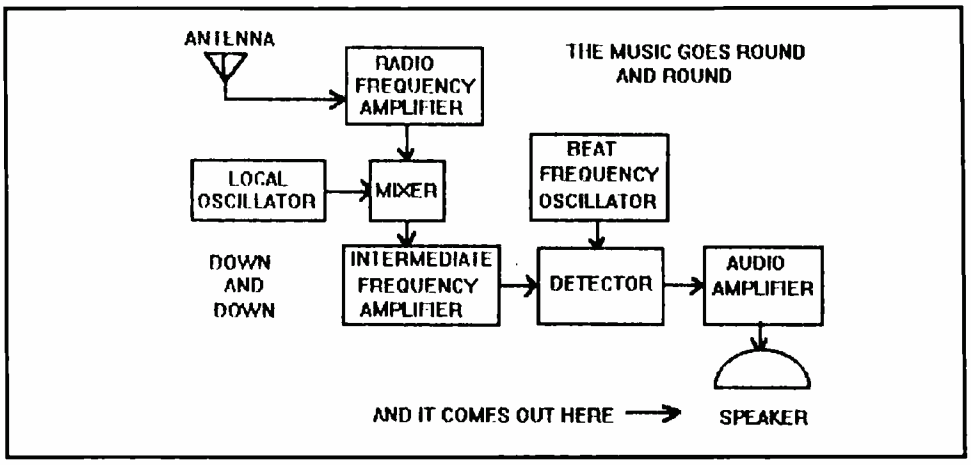
This mixing process is called HETERODYNING. The result of these heterodyned signals is a single signal that is lower in frequency.

The IF Amplifier

Old Mr. Signal has been through a lot since he first hit the antenna. He has been amplified, mixed, oscillated and heterodyned. So let's send him back to the gym for awhile. The INTERMEDIATE FREQUENCY AMPLIFIER builds him back up and gets him all tight and right for a trip to the detector circuit.

The Detector

This circuit does essentially the same task



The single conversion superheterodyne receiver circuit reflects all the essential components of a modern receiver.

that chunk of crystal did for our great grandfathers. The DETECTOR converts the intermediate frequency into an audio signal. The audio signal is in the frequency range that most folks can hear with their ears. If the incoming signal was an AM (Amplitude Modulation) signal, no sweat, it just moves on out the door to the audio amplifier stage.

However, if Mr. Radio Frequency Energy started out as a CW (Continuous Wave) or SSB (Single Side Band) signal, before he can be heard clearly the receiver must introduce another signal to replace the CARRIER signal that is missing from these types of transmissions.

The BFO

The BEAT FREQUENCY OSCILLATOR does the job of injecting a signal that replaces the missing carrier. The BFO SWITCH found on most receivers is used to turn the BFO signal to the detector on and off. You may also find a BFO PITCH knob that allows you to vary the frequency of this signal to allow for an audio signal that is easy to understand.

The Audio Amplifier

Because we've invested so much in the guy (and also because we like a nice loud signal at our speaker or headphones) let's take Mr. Radio Frequency Energy (who is now called Mr. Audio Frequency Energy) back to the gym. The audio amplifier will pump him up to truly Herculean proportions.

Now, with bulging biceps and broad shoulders, the big guy speaks. As the Voice of Radio Freedonia now prattles on endlessly about the record Belly Button Lint Harvest in Eastern Freedonia, we rediscover the true function of the power switch.

Conversion Experiences

The type of receiver we just took our little trip through is known as a SINGLE CONVERSION SUPERHETERODYNE RECEIVER. What this fancy talk means is that the receiver has taken the incoming signal and converted it (the mixer stage, remember) to another frequency before sending it off to the detector to change it into an audio signal.

If you are shopping around to purchase a receiver, you have probably seen advertisements bragging about DOUBLE CONVERSION or TRIPLE CONVERSION receivers. Higher quality receivers often have more than one mixer and intermediate frequency amplifier chained together. The additional stages are most often added as a way of improving a receiver's selectivity, its ability to differentiate between two or more adjacent signals.

Most quality receivers on the market today are at least double conversion in their design. If you happen to run across a fine old receiver from the late 1970s called the YAESU FRG-7000 take a good look inside. This nifty early digital readout rig is QUINTUPLE CONVERSION!

Thinking in Stages

Once you can grab on to the concept that all receivers are made up of a collection of separate stages, each with a specific function, it is easier to understand how all those stages fit together to get the job done. This way of thinking can even help a bit with trouble shooting.

For example, you may turn on your receiver one day and see the lights light up and the S meter deflect indicating an incoming signal, but the speaker makes no sound. Think through our diagram of a basic receiver and you probably can look first to the AUDIO AMPLIFIER stage to resolve the problem. Get the picture?

When a receiver malfunctions, it is often only one or two of the various stages that has gone out of whack. The Collins R-390A, a military surplus receiver popular among many DXers, has each of its stages more or less individually packaged in metal boxes. Care and feeding of this type of receiver is a simple matter of following a troubleshooting checklist and swapping out boxes.

Now you can sit down to this evening's DXing, armed with Uncle Skip's short course in receiver innards. No longer is the route the radio frequency takes through your rig such a mystery.

Rod Pearson

The Chain of Command

The recent break-up of the Soviet Union had many of us wondering about just who had control of the mighty Soviet nuclear arsenal (See October's Utility World). For awhile it seemed that no one knew who had control of the Soviet nuclear button.

It was evident, from the many letters I received, that nuclear forces of the Strategic Air Command were on alert during the coup. Communications on the HF and UHF SAC GCCS (Global Command and Communications System) were hot and heavy. Not since the Gulf War have the airwaves been so hopping with activity.

As usual, monitors had a front row seat during the coup. Shortwave was the place to keep tabs. International broadcasters such as the BBC and the Voice of America were an important source of the latest coup happenings. Even President Gorbachev himself relied on the BBC and VOA for news coming out of Moscow.

Amazing times we live in. The coup was both frightening and a gift to the world—Soviet communism's last great gasp before dying. It looked for a moment like the world was about to slip back into the icy grasp of the Cold War again. It makes one wonder what would have happened if it did.

On the 50-yard line

If the world was threatened with a nuclear war, military monitors like us would probably be the first to know that something was up. When hostilities broke out during the Gulf War, military monitors heard it first. In the event of a nuclear attack, the HF and UHF military channels would be alive with activity. Military monitors would again have a front row seat, this time, to Armageddon.

Just how would it all go down? Let us examine the system.

Nuclear scenario

If a nuclear attack was launched against the United States, a globe-spanning network of communications would come alive, linking U.S. military forces on the ground, at sea and in the air. Early warning satellites would detect the exhaust heat signatures of departing enemy missiles and alert duty officers at North American Aerospace Defense Command located deep under Cheyenne Mountain in Colorado. High speed computers would analyze the nature of the attack, compute possible targets of the missiles and suggest actions needed.

Immediately the National Military Command Center beneath the Pentagon and Strategic Air Command headquarters at Offutt Air Force Base, Nebraska, would be notified about the impending attack. Communications via VLF/HF/UHF/SHF and EHF frequencies would take place as commands were notified that an attack was underway. Nuclear-weapons-laden B-52s, B-1 bombers and hundreds of refueling aircraft would be scrambled within minutes and fly to their control points to await the go-codes.

A dramatic increase in military radio traffic would probably be the first indication to military monitors that something big was up. Emergency Action Messages would be repeated long and loud on all available communications channels. Test EAMs are a familiar sound to most military monitors as they are broadcast regularly on SAC's GCCS frequencies. The messages are a test of radio propagation and help confirm which circuits are usable.

After a joint Missile Display Conference to decide if the attack is for real, ideally only lasting a minute, the top brass is brought in for a Threat Assessment Conference. It is at this time that the President is notified of the impending attack and would take part in a Missile Display Conference at the White House.

If the threat is decided to be real, the President along with the Joint Chiefs of Staff and the Secretary of Defense fly by helicopter to Andrews Air Force Base and board a specially outfitted 747 called Kneecap, for NEACP, National Emergency Airborne Command Post. Military monitors should listen for the call sign Electric. The E-4B is nuclear hardened and equipped with the latest state-of-the-art communications equipment for contacting and directing a U.S. nuclear response.

The Football

A military aide to the President carries in a briefcase the go-codes that would be used to launch a nuclear attack. It is called "The Football" because aides are instructed to never drop it. It also contains a small transmitter that the President can use to communicate with SAC, NORAD and the National Military Command Center. The case is handcuffed to a presidential aide who accompanies him in around-the-clock shifts. It was a similar briefcase that was taken from Gorbachev while he was detained by hostile coup members.

The aide carrying the Football is never far from the President. It has never been confirmed, but it is rumored that other Footballs exist. If the President is killed in a nuclear attack, other Footballs are said to be in the custody of the Vice President and the joint chiefs of staff.

Giving the Go-codes

The President's go-codes to launch a nuclear counter-attack would be routed via NEACP to Looking Glass, SAC's airborne command post. Looking Glass would then spread the attack

Strategic Air Command Giant Talk Shortwave Network

Note: All frequencies are in upper sideband mode. shortwave receiver must be capable of upper sideband reception or have a BFO (Beat Frequency Oscillator) or reception will be garbled.
All frequencies are listed in MHz

Frequency	Channel	Usage
3.113	No known designation	Airborne Command Posts
3.292	No known designation	
3.295	Alpha Mike	
3.369	Alpha Sierra	
4.492	No known designation	
4.495	Echo	Airborne Command Posts
4.725	Victor	Primary Air to Ground channel air refueling
4.896	No known designation	
5.020	Foxtrot	Airborne Command Posts
5.026	Foxtrot	Airborne Command Posts
5.110	No known designation	
5.171	Two letter designation	Changes every 3 months
5.215	No known designation	
5.243	No known designation	Airborne Command Posts
5.328	No known designation	
5.680	Search and Rescue	All services
5.684	Foxtrot Quebec	
5.700	Bravo Quebec	Airborne Command Posts
5.826	Bravo Uniform	Airborne Command Posts
6.680	Foxtrot X-Ray	
6.712		Alpha Two in *PACAF
6.761	Quebec/Sierra 391 Nights	Primary Air/Ground
6.826	Golf	
6.840	No known designation	
6.853	Oscar	
6.870	Kilo plus two # designator	Airborne Command Posts
6.886	No known designation	
7.330	Yankee/X-ray	Alternating designation
7.983	Foxtrot Charlie	
8.101	Alpha Papa	Airborne Command Posts
9.023	A.I.C.C.	SAC/NORAD
9.027	Romeo	Primary Air to Ground channel
9.055	Papa	Airborne Command Posts
9.220	No known designation	
9.234	No known designation	NORAD/SAC
10.452	Oscar	*PACAF designation
10.510	No known designation	Possible *PACAF channel
11.110	Alpha 21	
11.118	No known designation	Airborne Command Posts
11.220	Bravo	
11.243	Alpha ONE/Sierra 393	Primary Air Ground Days
11.408	Yankee Quebec	Data Channel
11.494	Lima messages	Training/Practice
11.607	Alpha Zulu	
13.205	FAX	SAC SPECIAL OPS
13.211	Bravo Whiskey	Airborne Command Posts
13.241	Sierra	Primary Air/Ground channel
13.547	No known designation	
13.907	Alpha Charlie	
14.716	Sierra Echo	
14.744	Alpha Tango	
14.775	Mike	*PACAF
14.955	Charlie	
15.035	Charlie Quebec	Canadian Forces (shared)
15.041	Mike	Primary Air/Ground
15.091	Bravo X-ray	TAC-SAC communications
15.544	No known designation	Point to Point channel
15.962	India	
17.617	Bravo Hotel	
17.975	Tango	Primary Air-Ground
18.005	Tango 2	*PACAF
18.046	Juliett	
18.594	Zulu One	
20.631	Whiskey	Primary Air/Ground
20.737	No known designation	*PACAF
20.740	Lima	*PACAF
20.846	Charlie Alpha	SAC to **CAP
20.890	Delta	
21.815	Foxtrot Sierra	
23.337	Uniform	
23.419	No known designation	SAC-NORAD
27.870	Delta Quebec	

*Pacific Air Force
** Civil Air Patrol

EGLIN AIR FORCE BASE FLORIDA FREQUENCIES
ATIS: 273.500
Ground Control: 335.8, 121.8
Eglin Command Post: 320.7, 372.8
33rd TAC Fighter Wing CP: 290.9
4486th FWS: 397.000
Departure: 358.300, 119.300
Meteo: 342.500
Tower: 348.400
Approach: 322.600, 340.900, 378.800, 391.200, 125.100, 125.6, 124.050
4485th TS Ops: 236.8, 138.250
Discrete CP: 303.050
TAC Command Post: 381.3, 390.9
GCA: 341.9, 389.1, 398.200

HURLBURT FIELD FLORIDA FREQUENCIES
Approach/Departure : 322.6, 358.3, 125.1, 119.300
Ground Control: 275.800
Command Post: 320.700, 140.400
Tower: 291.100, 126.500
Dispatch: 372.200
Meteo: 375.200

Table 2

orders by communicating directly to U.S. missile silos and bombers. UHF frequencies such as SAC primary 311.000 MHz and SAC secondary 321.000 MHz are prime frequencies for listening.

In the event that a real nuclear war took place, the messages would be relayed on as many frequencies as possible, including VLF, HF, EHF and SHF frequencies. Air Force and Navy satellites such as AFSATCOM, MILSTAR, MARISAT and DSCS 3 would be pressed into service as well. To order a submarine-based nuclear attack, Looking Glass would transmit its orders to TACAMO, a Navy airborne command post, directing subs via Very Low Frequency (VLF) radio. In any event, the airwaves would be alive with the sounds of go-codes being broadcast over and over again on every available channel.

In theory, when nuclear warheads begin to detonate, most, if not all, communications will be destroyed or disrupted by either the nuclear explosions or the electro magnetic pulse. Nuclear detonations emit a super-strong radio pulse that would burn out all functioning transmitters and receivers. Even receivers turned off would not survive the EMP effects.

Ironically, the only receivers that would work after a nuclear confrontation would be old '50s-era tube type radios, which are not as susceptable to EMP burnout. Today's delicate microchip miracle receivers would not stand a chance against EMP—another good reason to hold on to that old Hallicrafters.

In Reality

With the collapse of communism in the Soviet Union, the chances of an east/west nuclear confrontation are greatly diminished. Massive nuclear weapon reductions on each side are expected. NATO is already moving nukes out of Europe.

Unfortunately we cannot un-invent the nuclear bomb. Just because it appears that the Soviet Union is not the threat, doesn't mean there aren't others which pose a threat. China is still a potent communist nuclear-weapon-bearing nation and late reports say that North Korea has just acquired the bomb. Many nuclear weapons once under the control of the Soviet Union could well be in the hands of those Soviet republics that are dropping out of the union. Some of these republics could fall under control of unstable dictators. But our biggest fears are that a Saddam Hussein-type Mideast kingpin could acquire the bomb.

What would happen if a terrorist got hold of a nuclear device? How would the U.S. respond? Next month the Federal File will examine how well the U.S. system would work during an attack and the communication systems involved.

Mailbag

• Sorry, folks; events on the international scene have had me twiddling the dials more than answering the mail, but perhaps I can be forgiven. Please bear with ole Rod, and I'll get your letter answered yet.

I received a great letter from Pete Hitchcock who is attached to NATO AWACS radio operations. Pete says that RC-135 ELINT aircraft types, such as those described in the July "Federal File," never had Side Looking Aperture Radar or VLF trailing wire antennas. I checked with my sources and Pete is absolutely right. The cheek flairings on the aircraft contain all kinds of ELINT gear but not SLARs and the cheek flairings could possibly house a steerable antenna system or radio triangulation gear. Thanks, Pete, for setting us straight.

Florida Mil Monitor

• Jack NeSmith from Deltona, Florida, writes in and has a few questions about monitoring Eglin Air Force Base and Hurlburt Field. He says he is having trouble receiving the approach and departure frequencies. He has had 291.900, 322.600, 398.200 and 315.900 punched into his PRO-2004, but without success.

Jack, my listings for Eglin approach/departures are 358.300, 119.300, 322.600, 125.100, 340.900, 125.600, 378.800, 391.200 and 124.050. For Hurlburt Field I have listed as the approach/departure frequencies 322.600, 125.100, 358.300 and 119.300. Some of these are in your scanner but you might try the other listings and see if you have any luck. See Table 2 for a complete listing of Eglin/Hurlburt frequencies.

Special thanks go to James Storm of Laconia, New Hampshire, for his thought-provoking letter about the "Federal File's" account of monitoring Day One of the Persian Gulf War. James' letter was an in-depth look at how important monitors and monitoring can be, especially during conflicts like the Gulf War. Utility and military monitors played an important role in getting the real story out. James addresses many questions and issues involving monitoring and a free society. Unfortunately, space in this column prohibits me from addressing them in depth. Thanks, James, for the great letter just the same.

Alpha Air Force One

• Phil Lewis writes from Anchorville, Michigan, that he recently monitored Air Force One on 415.700 MHz. Phil says that in one conversation he heard mentioned a frequency called Alpha. Phil asks if anyone knows what Alpha is.

Phil, the only listing I have for an Alpha channel is a Secret Service close proximity guard channel on 166.5135 MHz. Recently many monitors have reported AF-1/AF-2 communications on a new channel, 305.550 MHz, but no designator has been heard. Is there anyone out there who can shine some light on this Alpha subject?

Intercepts newsletter

We understand many "Federal File" readers have taken advantage of contributor Steve Douglass's free military frequency list offer over the past few months. It seems, though, that Steve had an ulterior motive in being so generous with his HF/UHF frequency list giveaway. Steve has started a monthly newsletter for military monitors called *Intercepts*. People who responded to the freebie frequency offer also received a sample copy of the *Intercepts* newsletter.

Judging by our sample, the newsletter is filled with information that would be of great interest to any serious utility or military monitor. Cost for a subscription is $12.50 for 12 issues. This first issue includes military frequencies that were active during the Soviet coup, plus a look at the Soviet nuclear chain of command. If you would like a sample copy, including the free list, send a large SASE to Steve Douglass, 6303 Cornell, Amarillo, Texas 79109.

James R. Hay

VTS and VTM: Managing Ship Traffic

This past summer, a Chinese freighter, Tuo Hai, rammed the Japanese fish processor Tenuyo Maru in Puget Sound. This accident and some of the surrounding circumstances can make for some exciting listening. While HF maritime calls are the glamour aspect of the hobby, the VHF side should never be overlooked. Although VHF is local, it can provide some of the most interesting listening. VHF is where you will find the Vessel Traffic Services (VTS) or Vessel Traffic Management (VTM) communications which will keep you abreast of who is in port.

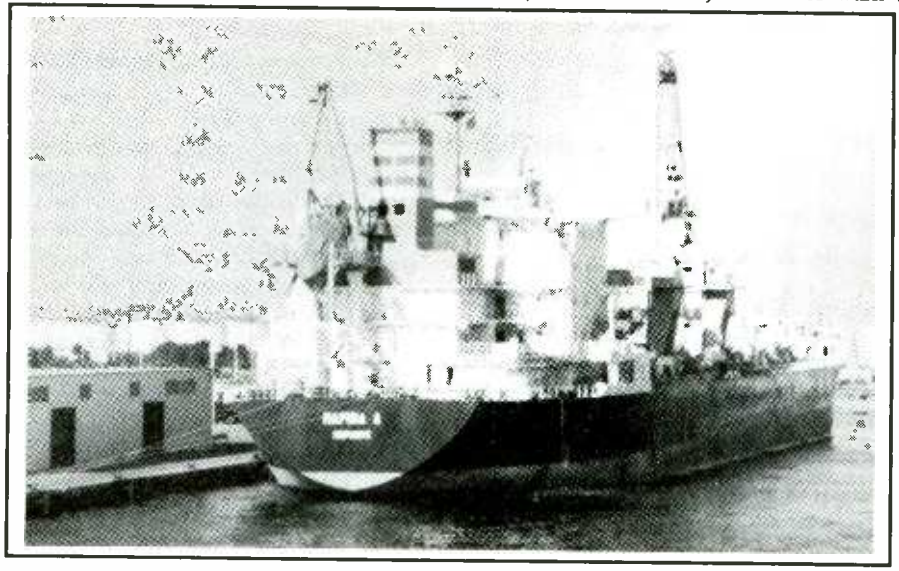
VTS stations exist in most ports and congested waterways. In the case of the Tenyo Maru incident, there is a VTS system which covers Puget Sound and Strait of Juan de Fuca area, jointly operated by the Canadian and United States coast guards. Ships' movements are monitored by radar and ships are required to report their position, speed and sometimes course at certain specified points. The radio operator at the VTS center will advise the ship of any other vessels in the area and may suggest a course of action. In areas such as Juan de Fuca and Puget Sound, the VTS operator's instructions are not compulsory.

In contrast to this system, many ports and areas such as the St. Lawrence Seaway use a VTM system which requires the ships' officers to obey instructions given by the VTM radio operator. This system is most effective when there is a way to enforce the instructions. In the St. Lawrence Seaway system, a recalcitrant ship can be fined and the vessel can be made to wait at anchor or tied to the approach wall of a lock until the ship's agent either pays the fine or posts a bond.

Harry Baughn

Either system will provide interesting listening because of problems which will crop up. Anyone near Puget Sound would have been able to follow what was happening during and after the Tenyo Maru incident by following the reports of the VTS operator to other ships in the area. Those along the seaway can learn about incidents which have happened by monitoring the traffic controller's communications.

Both humor and tragedy can be found on these frequencies. Language problems abound. It is rumored the crew aboard Tuo Hai could not speak English and may therefore have ignored radio calls. According to an article in the *Seattle Times* sent in by reader Hugh Miller of Woodinville, WA, "The Canadian vessel traffic system operators tried in vain to raise the Chinese ship on radio for several hours, asking for the unidentified vessel by giving its location each time. (The Coast Guard) wanted to warn the captain that a large number of fishing vessels were working off the mouth of the strait." By the time the fishing vessel saw and relayed the name to the authorities, it was too late to stop the Tuo Hai from hitting the Tenyo Maru.



Harry Baughn

On the other side of the spectrum on the St. Lawrence Seaway, there is bilingual operation in the Canadian sectors. This means the masters and pilots can speak either English or French to the radio operators at Seaway Beauharnois and Seaway Iroquois. Seaway Eisenhower's operators do not speak French and it is amusing to hear the occasional slip-up as a pilot tries to speak French to the American operator. Those who understand French may also be amused by comments made by captains and pilots occasionally knowing that the seaway radio operator cannot understand what is being said.

Try looking for VTS and VTM stations in your area on any of the frequencies below.

ch. 9	156.450 MHz
ch. 10	156.500
ch. 11	156.550
ch. 12	156.600
ch. 14	156.700
ch. 18A	156.500
ch. 67	156.375
ch. 71	156.575
ch. 74	156.725

More New Frequencies

When I published the list of new frequencies for Halifax Coast Guard Radio (VCS) I mentioned the new 22 MHz frequency had yet to be decided. The frequency was finally published and is 22619.5 kHz. Following are some other frequencies which the Canadian Coast Guard has changed:

• Cambridge Bay CG Radio (VFC) and Coppermine CG Radio (VFU 6) are now both using 4363.0 kHz for HF USB communications.

• Inuvik Coast Guard Radio (VFA) is now using 4363.0, 6501.0, 8794.0 and 13116.0 kHz for their HF USB communications.

• At Iqaluit Coast Guard Radio (VFF) the new HF USB frequencies are 4375.0, 6507.0, 6513.0 and 8752.0 kHz. Most readers will probably recognize Iqaluit by its former English name of Frobisher Bay. At VFR in Resolute the new USB frequencies are 4375.0 and 8791.0 kHz.

• 4375.0 kHz is also used by Labrador CG Radio (VOK). Thunder Bay CG Radio (VBA) at their remote transmit/receive site of Churchill, Manitoba, also uses the same frequency.

• Finally there is Vancouver Coast Guard Radio (VAI) which is the high seas station for the Canadian west coast. The new RTTY frequencies in kHz are: 4214.5, 6318.5, 8428.5, 16822., and 22391.5. Upper sideband frequencies are: 4384., 6513., 8737., 13095., 17263., and 22753.

As was the case with Halifax CG Radio, only the 22 MHz CW frequency has changed with the new one being 22368.5 kHz.

Before I wind up this month's column, I want to let you know that I have not forgotten my promise to give you more information on the reasons for the changes in HF frequencies and how they relate to the Global Maritime Distress and Safety System (GMDSS). Like many other government organizations, the International Telecommunications Union (I.T.U.) does not always move quickly. As I write this, I am hot on the trail and will pass on the information to you as soon as I get it.

Since this is the last column until the new year, let me wish each of you a happy holiday season. Good listening until January.

Reading Monitoring Times teaches me more about monitoring each month. I find it very helpful and look forward to each issue!

1991 Survey Comment

Karl Zuk

Is An Acorn In Your Future?

The digital revolution has begun. Old phonograph records have been replaced by compact disks. Offices and homes now use computers instead of typewriters and pencils. The world of radio is not far behind. New digital signals will soon deliver sound indistinguishable from live performances, over the air, to you.

Many digital audio broadcasting (DAB) schemes have been proposed for use in America. Until recently, most of them shared a common problem. To transmit digital quality sound, a new band of frequencies would have to be created. All existing radios would become obsolete, since early systems were designed to use frequencies of 1.5 gigahertz or higher.

A big move like this is never easy. How would today's broadcasters be positioned into a new digital band? Would AM radio stations be allowed to upgrade to digital and be able to compete equally with FM stations? Would powerful clear channel stations maintain their dominance? It might be years before the FCC could devise an acceptable compromise. The potential for chaos is enormous.

The broadcast industry is big business. Reassignments of operating frequencies and powers could change an existing station's dominance, profits, and worth dramatically. So to maintain the status quo, a consortium was formed to develop a DAB system which is fully compatible with all of today's FM and AM analog broadcasts.

CBS Radio, Gannett Broadcasting and Group W have joined forces to create a new firm called USA Digital Radio. Using the code name Project Acorn, they searched for a way to ease radio into the digital future. Some of the finest engineers in the country were assembled to create the Acorn DAB system. Conceived by Tony Masiello of CBS and Gannett's Paul Donohue, the system was carefully refined and developed by Corporate Computer Systems of Holmdel, N.J., and the famous Stanford Research Institute.

Acorn DAB has emerged as the most amicable solution to the digital broadcasting dilemma to date. Masiello explains: "The closest analogy is the transition to color from black and white television. We simultaneously transmit the digital and the analog. The digital signal is buried below the analog. On an existing analog receiver, you continue to receive analog. The new digital receivers will receive the digital signal, and neither will interfere with the other."

Acorn DAB utilizes and combines several ingenious developments in high technology to bring clean digital sound home to you. The music and voices that create a radio station's sound are first digitized using a system called Musicam. Just like your home computer converts keystrokes into a digital language, Musicam converts music into a similar series of ones and zeros. All the information is compressed, removing unnecessary redundancy, so it can be sent as efficiently as possible.

When you drive between buildings or behind hills, many forms of interference can disrupt a radio transmission. Acorn DAB was designed to be extremely resistant to problems that plague reception, like static and FM multipath. This kind of interruption would cause gaping holes in the transmission of the ones and zeros if they hit the airwaves in sequential order. The holes would create very perceivable gaps of silence. Listening to this mess could make you crazy.

Shuffling the sequence of the numbers emerged as a good defense against interference. Musicam's data is separated into bunches lasting about a half-second each. The data is then converted into a new nonconsecutive fixed pattern. By shuffling the data, a burst of static will cause tiny breaks in the transmission instead of a big hole which is harder to repair.

Acorn DAB also shuffles frequencies. A CBS Radio technical study revealed the most common type of FM interference, called multipath, occurs when narrow slices of an FM carrier's bandwidth are lost. Multipath creates the familiar swooshing sound called "picket fencing." Run a stick along a wooden fence for a quick reminder. You'll hear multipath driving through most big cities where buildings block and bounce signals around at will. This could cause lots of digital reception problems, too.

Sophisticated defense technology easily met this challenge. Standard FM broadcasting depends on one broadband carrier. Twenty-one individual independent carriers are buried and hidden underneath the broadband analog FM signal to bring you Acorn DAB. This sneaky method of using one powerful signal to mask another was developed for the highest security in military communications. Acorn borrowed the idea for a new application—digital broadcasting.

The benefits of broadcasting on 21 hidden carriers is two-fold. When multipath strikes Acorn DAB, only one or two carriers are lost out of 21. Very little data is destroyed, and the signal remains relatively unharmed. Then, listen to the station on an analog radio. You'll never be able to tell the digital signal is there. It's totally compatible with FM radio as you know it.

Built into the Acorn DAB system is a separate data stream for digital error correction which improves interference immunity even further. When great portions of data are lost to static or lack of signal strength, random noise is cleverly blended into the resulting sound. The digital program doesn't abruptly stop. It will fade away just like a regular radio does. When small amounts of interference are received, intelligent circuitry will fill in missing data for seamless reception.

There's room in Acorn's data to digitally duplicate analog FM's subcarrier services where Muzak, reading services for the blind, and other programming are currently broadcast. Every facet of today's broadcasting business is preserved using Acorn DAB.

Your new digital receiver will reverse all these complicated steps, and you'll receive crystal clear stereo sound. The results are indistinguishable from the playing of a compact disk on your home stereo. A slightly different system has been designed to keep AM broadcasters competitive with FM. Acorn AM DAB produces sound quality equal to current FM broadcasts in full digital stereo.

Developing digital receivers for your home, car or Walkman portable is a major feat in itself. These complex digital signals have to be decoded, restored and converted back to audio contained in a reasonably-sized package. Masiello talks with experience. "Anybody can build a system with enough chips and horsepower to make anything work. You don't want to have a guy jogging in Central Park and have to ask him, 'Who's that guy behind you with the wheelbarrow?' 'Oh, he's got my radio.' You have to have some sort of commercial viability." Compact, practical circuits must be developed to complete the job. Design laboratories are feverishly refining receiver prototypes as you are reading this article.

Other proposed DAB systems, relying on direct broadcasts from satellites, now seem cumbersome and impractical compared to Acorn DAB. "You can't jog with a satellite dish on your back," says Tony. Acorn DAB continues the tradition of local broadcasters operating within a specific area. Satellite-delivered systems were conceived to appeal to nationwide audiences with little identification to hometown communities.

If adopted as a nationwide standard, Acorn DAB will allow America's broadcasters to hold

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

on to their current frequencies and transmission powers and convert to digital broadcasting with very little cost or listener confusion. Your old radios will keep playing, and, if you buy a new digital radio, your favorite station will sound better than ever before.

Bits 'n' Pieces

Football season is in full swing and FM radio stations have possession of the ball. Play by play usually heard on AM is moving to FM outlets nationwide. As the numbers of stations increase rapidly. Program directors are endlessly searching for new ways to draw large audiences and keep advertising revenues high. Sports coverage has become a vehicle to success.

Tom Rivers, program director of WQYK in Tampa Bay, loves broadcasting Buccaneers football. "Tampa does not have a major league baseball club or a hockey team yet. The only major sports team is football, and for that reason we saw a real advantage to acquiring the rights to the broadcasts." Rivers says, "The biggest risk is that you are not playing music," but since most of the games air at night or on Sunday afternoons, "the risk is minimized and the games are an excellent image enhancer."

WPCH in Atlanta has found a big winner in baseball. Its big competition is WSB, a 50,000 watt AM station, which held the rights to all the major sports events in town until recently. After years of negotiations, Atlanta Braves baseball now calls WPCH home, and the results have been awesome. "It brings the hottest franchises in Atlanta to our station. It propels us forward and brings in several million dollars in new advertising."

Finding your favorite sportscast has become a challenge in itself, especially if you are out of town. For an up-to-date and highly detailed list of stations, nothing beats an IRCA updater. Leaving no stone unturned, International Radio Club of America can tell you where to listen for coverage of virtually any professional or college team anywhere you go. For information, send an SASE to: Bill Hardy, 2301 Pacific Ave., Aberdeen WA 98520.

Mailbag

• There's a lot of static in Static—Tennessee, that is. Someone is stealing radio stations. Vandals broke into WSBI and tried to steal the main audio console, but could not remove it. Major damage was done in the process. The chief engineer managed to jury-rig some equipment to keep the station on the air until repairs could be made.

A month later, Albany's "Very Own Country Sunshine," WANY-AM and FM in nearby Albany, KY, was ransacked. New equipment worth $15,000, including the main console, turntables, amplifiers and a new microphone were lifted from the station overnight. "They really cleaned us out and put us off the air for several days," WANY co-owner Phyllis Butler said. A note was left at the station by the burglars: "We did to you what we did to WSBI."

The crimes remain unsolved, although both stations have returned to the air after quick repairs and receipt of insurance payments. Destroying a radio station is a serious federal offense. *MT* reader Bob Lucore sent in this item originally printed in the *Lexington Herald-Leader*.

• What's on in Havana? Jeff Plotkin of Brooklyn, NY, knows. Jeff is a purchasing agent for ABC Television and personally designed an amazing television reception system for ABC TV's crew covering the 1991 Pan Am games. Not wanting to be at the mercy of Fidel's programming, powerful antenna systems were erected on the top story of a high-rise hotel in Havana and pointed at Florida to receive visions of home. The results were amazing.

Unfortunately, unused VHF channels were jammed with low power carriers transmitted by the Cuban government to prevent local residents from seeing American television. All the fun was on the UHF frequencies. Every channel was clear and ready for reception of long-haul tropospheric skip. Floridian television stations were enjoyed every morning and evening by the ABC crew, and stations from as far away as Corpus Christi, Texas, and South Carolina were logged during their stay. Blonder-Tongue professional Yagi arrays were combined with extremely high-gain preamplifiers and distribution equipment on this expedition.

New Station Grants

Check these frequencies for the latest stations on the air. Meridianville, AL 94.1; Hogansville, GA 97.5; Augusta, IL 101.1; Battle Ground, IN 98.7; Dennysville, ME 102.9; Essexville, MI 97.3; Chillicothe, OH 91.9; John Day, OH 91.9; Comfort, TX 95.1; and South Boston, VA 95.3. Courtesy *The M Street Journal*.

For Sale

"I've got a loverly bunch of coconuts" is the new theme song of Chris and Judy Racine. They have just made the purchase of the century. The Racines now own the construction permit to build KBQN-AM in Pago Pago, American Samoa. It will be a 50,000 watt clear-channel station on the split frequency of 585 kHz. KBQN could cover most of the Pacific Ocean using a low frequency like 585 kHz with such enormous power. The price tag was a mere $25,000.

If you would rather go back to a little grass shack, a one-kilowatt AM is ready for sale in Hawaii. It features a nondirectional pattern and full-power 24-hour-a-day operation. A power increase for the station is very possible in the future. Write to: Richard Miller, 33 Hui Drive, Lahaina, Hawaii 96761.

Stateside, two Texas stations are ready to roll. One is a Class C-1 FM in a city with over 200,000 potential listeners. Also available is an AM/FM combo station in eastern Texas which includes a vast amount of real estate. Call Whitley Media at 214-788-2525 for details.

International Bandscan

Attention AM DXers worldwide! New signals will soon reach your radio from the Caribbean. Radiovision Christiana is building several stations on South Caicos Island in the British West Indies. Included in the project will be a power upgrade of the Atlantic Beacon. Currently operating with 25 kilowatts, the station is heard all over North and South America, and is a regular catch for listeners in Africa and Europe. The Atlantic Beacon, operating on 1580 kHz, will soon quadruple its power to 100 kilowatts.

Another 100 kilowatt outlet will come on the air early next year on 530 kHz from the same site. With a perfect location and frequency for groundwave transmission, and a 500-foot tower, the station will be heard in Dominican Republic, Haiti, Cuba, North Carolina, Florida and in most of the Gulf Coast states in the daytime. Nighttime coverage is expected to cover almost every corner of the world.

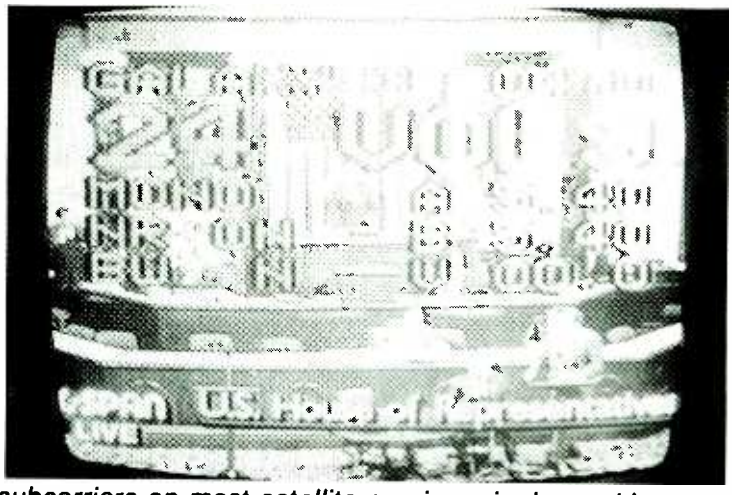
When the Atlantic Beacon completes its new facility, it will include two AM 100 kilowatt transmitters at 530 and 1580 kHz, a 100 kilowatt shortwave outlet, and FM service on 100.1 MHz with a 50 kilowatt transmitter. If you can't hear this, you need a new radio.

Credits

Readers Ron Carruthers, Malcolm Kaufman, Bob Lucore, Jeff Plotkin, Bill Mozer, David Parsons and W. Earle Doan contributed this month. *Radio World, Broadcasting Magazine,* and the British DX Club provided information. Until next month, happy trails.

Listening To Your Satellite Dish

Of the nearly three million satellite television installations which are at present in the ground, most were purchased for the pleasure of watching the 120 or more video channels available. But there is a group whose interest lies in the purely audio channels carried by the satellites. International broadcasters, domestic AM and FM stations, sports events, news networks, and much more are all to be found on your backyard satellite dish, once you know how to tune them in.



Xenolith Press

Tuning audio subcarriers on most satellite receivers is done with on-screen graphics. Note that video is C-SPAN, but audio is tuned to 5.40 MHz: BBC World Service.

What you'll need

It might seem since we're only interested in receiving audio with a dish that we can get away with considerably less in the way of equipment. Unfortunately, this is not the case. In fact, to take full advantage of the audio opportunities even more equipment may be necessary.

To begin, you'll need what has become the standard home satellite television installation: A 10-foot diameter parabolic antenna (the dish); a decent Low Noise Block downconverter (LNB) with an output of 950-1450 MHz; a "feedhorn" which guides the microwave signals bouncing off the reflector into the LNB; a satellite receiver which tunes the frequencies provided by the LNB; and the necessary cables to attach the electronics at the dish to the receiver. Oh yes, it will be helpful to also have an actuator (motor) which moves the dish from one satellite to another.

All of the above equipment has been standardized so that any new system will provide almost identical reception. This is unlike the scanning or shortwave listening hobby where receivers costing a tenth of the price of higher quality radios can be expected to perform at a tenth of the ability of higher priced receivers. (However, as in the scanning and shortwave hobby, a better antenna is the best way to improve reception.)

The bottom line

What you'll end up paying for your system depends on what you get and where you find it. Your local satellite dealer can install a top grade system for two to three thousand dollars.

Good used systems are available through dealers or local newspaper ads for about half that price. There are those who haunt the hamfests and close-out catalogs to piece together complete systems for well under $500. The more you pay, the more bells and whistles you'll get.

FM audio subcarriers

The easiest listening on your dish comes from the many FM audio subcarriers which abound on virtually all satellites. The bandwidth provided by every satellite channel is considerably wider than the frequency spread actually used by the broadcast. This extra space is put to good use on the satellite by making it available for audio signals different from those needed to accompany the video.

FM audio subcarriers are tuned by all satellite receivers in a frequency range typically from 5.00 MHz to 9.00 MHz. There are, however, some subcarriers which can be tuned from .15 MHz but they will require additional equipment which will be noted later. The best example of the FM audio subcarrier system is heard on Galaxy 3 channel 11. Here the video is from Mind Extension University. Its program audio is heard on 6.80 MHz, programmed into most satellite receivers as the "default" audio frequency for accompanying video.

Tuning the audio on your satellite receiver you'll notice that Jones Intercable, the lessee of the channel, also provides the following audio services under the banner, Superadio: America's Country Favorites, 5.04 and 7.74 MHz discrete stereo; Prime Demo, 5.22 and 5.40 MHz DS; Soft Sounds, 5.58 and 5.76 MHz DS; Light 'n' Lively Rock, 5.94 and 6.12 MHz DS; Classical Collections, 6.3 and 6.48 MHz Ds; New Age of Jazz, 7.38 and 7.56 MHz DS; and Classic Hits, 8.10 and 8.28 MHz DS.

By the way, the discrete stereo mode mentioned has developed as the industry standard over the years. In the beginning there were three modes of stereo transmissions, and receivers had to be able to handle all three. With the inception of VCII scrambling technology, the stereo signal became a digital part of the data stream which is used to key authorization. This audio is automatically tuned by the VCII and does not affect other audio subcarriers found on the same channel. Also note that the two frequencies listed refer to left and right channels.

What's on where

There isn't nearly enough space in this column to list all the FM audio subcarriers which can be found on the various satellites. The last time I counted there were around 110 FM audio subcarriers excluding duplicates. But, let's look at some of the things you'll be listening to.

KSKA-FM, Anchorage, Alaska, features programming from Alaska Public Radio and is found on Aurora 2 channel 24 (139 degrees W). Japan Cable Radio, radio programming from Tokyo, is found on Satcom F1R channel 15 (131 degrees W). KNOW-AM, Minneapolis-St. Paul, Minnesota, features public radio programming on Westar 5 channel 20. XEX-AM from Mexico City is found on Morelos 2 Channel 14 (116.8 degrees W). Radio France Internationale can be heard on Anik D2 channel 17 (111.1 degrees W). Radio Canada is heard on Anik E2 channel 15 (107.3 degrees W). Business Radio Network resides on Galaxy 3 channel 8 (93.5 degrees W). The BBC World Service can be heard 24 hours a day on C-SPAN Audio 2, also on Galaxy 3 but on channel 24. CNN Radio Network can be found on Spacenet 3 channel 9 (87 degrees W). RAI Radio Net, the Italian Radio Service, is heard on Satcom F4 channel 3 (82 degrees W). The Voice of America can be found on Spacenet 2 channel 21 (69 degrees W).

It has always surprised me that people promoting satellite television spend so little time emphasizing the audio aspects of satellite reception. As you can see from the sampling

above, there is an enormous variety of programming to be had from these stereo, high-fidelity, unscrambled services which add so much to the value of owning a TVRO (Television Receive Only) Earth Station. To many of us who have always loved the medium of radio, these audio services alone would be worth the price of a system.

Up-converter

Mentioned earlier in this column was the fact that some audio subcarriers occur on frequencies which are out of the tuning range of many home receivers. Luckily, these services, too, may be received with the aid of an up-converter which converts the lower frequencies to ones recognized by your receiver. Ready-made versions of these up-converters are available through TVRO catalog companies such as the Sky Store.[1]

More capable experimenters will want to build their own up-converter. Plans for one may be found in the fall 1983 issue of *Hands On Electronics* magazine (Gernsback Publications, 500 Bi-Country Road, Farmingdale, NY 11735). With less than 25 such low frequency services available one may find that it isn't worth the effort.

For a complete listing of all subcarrier services see the address below for Satellite Channel Chart.[2]

But wait, there's more

As if all of the above hadn't been enough, it turns out that we've just begun. There are at least a hundred other FM audio subcarriers broadcasting on a much narrower bandwidth and with a different transmitting technique.

Transmitting on what is known as Single Channel Per Carrier (SCPC) are all the smaller networks which use satellites for affiliate distribution but can't afford the more expensive FM subcarrier mode. Virtually all college athletic events for radio and all NFL, NHL, NBA, Major League baseball as well as many minor league teams are carried.

In addition, you'll find every radio news network including UPI, AP, NPR, CBS, ABC, NBC and Mutual. You'll find quite a few you may not recognize like Southern News Network, The Greek Network, Motor Racing Network, Texas State News Network, and Soldiers Satellite Network. The Satellite Channel Chart lists 53 such networks on Westar 4 channel 3 alone.

The main difference between FM subcarriers and SCPC/FM subcarriers is that the FM subcarriers require the presence of a video carrier to make it to the satellite and thus into your receiver. As noted before with Mind Extension University, all the other audio subcarriers are "riding" on the video carrier. If the video carrier were to fail, the audio would disappear as well. In the case of SCPC, each carrier, or signal, is uplinked on its own. Even though 53 separate transmissions are located on the same transponder, none of them are related. If one goes down, the others won't even know it.

Tuning SCPC

Tuning SCPC transmissions has been widely covered in numerous publications so I'll keep this short. There are basically two ways to receive SCPC. The most satisfying is to use a sophisticated receiver such as the ICOM R-7000 or a top grade scanner such as the Realistic 2006 or similar model.

Using the baseband video out from your satellite receiver, plug into the antenna jack of the radio. Be careful, and double check your cables to make sure you're not putting DC current into the receiver which will damage the radio. You may also use a commercially built consumer grade SCPC radio, such as the Heil SC-One[3], in which case you would feed the down-converted coax signal directly into the back of the SC-One from the dish. It's that simple.

The second and much less expensive route is to take the 70 MHz input loop off the back of your satellite receiver, split it, feed one leg into the antenna of a cheap portable TV audio radio, such as the PortaVision 40 from Radio Shack, and the other leg back into the input of the 70 MHz loop. Turn on the radio and start tuning the lower TV band. Every inch or so you'll hear SCPC signals, and I guarantee it will be quite a thrill.

Is that all?

Well, that's what you can hear. What you can't hear are the numerous digitally transmitted audio subcarriers via video carrier or SCPC. There are some 80 channels of digitally transmitted programming from the big radio networks on Aurora 2. Additionally, Digital Planet (Spacenet 1, 1), Digital Cable Radio (Galaxy 3, 5) and Digital Music Express (Satcom F4, 19) will be unavailable as well.

It's quite possible in the case of Digital Music Express that even that service will be made available to the TVRO market in the future. Until then we'll just have to learn to enjoy the hundreds of radio services available to us through our backyard dish.

mt

1. The Sky Store has up-converters available. Write them at United Satellite Systems, St. Hilaire, MN 56754 or call 218-681-5616.

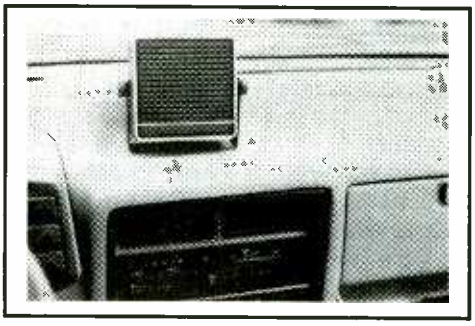
2. The best listing of audio subcarrier, SCPC and digital services is the Satellite Channel Chart published by Westsat Communications, P.O. Box 434, Pleasanton, CA 94566, or call them at 415-846-7852. Subscriptions for this bi-monthly are $65 per year.

3. The Heil SC-One is available from Heil Sound, #2 Heil Drive, Marissa, IL 62257; phone 618-295-3000.

Ike Kerschner, N3IK

Ham Goodies

Every year at this time I like to feature a variety of products that I have used during the year. Each product has been thoroughly tested and is what I consider top value. So take a look at each, circle the ones you like and leave these pages of *MT* open so Santa can get an idea of what his good little ham wants!



Mobile Speaker

If you use an HT mobile, you know how difficult it is to hear the low power audio coming out of that little speaker. Our friends at Radio Shack have come up with the perfect answer to the problem with their 21.541 mobile speaker.

Producing seven and a half watts of audio output, this unit allows your HT's audio to overcome all of the external noise associated with mobile operation. Available at all Radio Shack stores, price is $23.95.

Lakeview Antenna Co.

You heard my enthusiasm for Lakeview's HF antennas in the August 91 column. My impression of these antennas has been so favorable that I decided to obtain one of their 5/8th wave two meter magnet mount antennas to replace my aging 1/4 wave unit. The results were outstanding! Previously on my 50 mile commute to work I was able to work my favorite repeater for about one third of the trip; with the new antenna, reliable communication is possible for the entire commute! At $29.95 this is a best buy.

The Lakeview GP-1 is another 5/8th wave antenna for two meters that is designed to be used at a fixed location. This antenna can be mounted on a 1 to 1-1/2 inch mast.

With this unobtrusive antenna mounted 25 feet above ground I can easily work stations on 145.58 simplex out to 30 miles with my HT. And repeaters that were scratchy before are now full quieting. Cost is $22.50.

Both the mobile and the fixed antennas are also available for 220 work. Lakeview antennas can be ordered direct by calling 1-800-226-6990 (The 800 number is correct); or by writing to Lakeview Co., 3620-9A Whitehall Rd., Anderson, SC 29624. Lakeview has an extensive line of antennas, so be sure to obtain their catalog.

MFJ-207 HF SWR Analyzer

MFJ has really gotten a jump on the industry with this product. The model 207 SWR analyzer allows you to tune your antennas to an exact frequency without running back and forth to the rig. Simply cut the antenna and connect the analyzer to the feed point, turn the dial and watch for the minimum SWR point, then prune as required to move the minimum SWR to the desired frequency.

The dial is calibrated fairly accurately, but for precise tuning connect a digital frequency counter to the RCA connector located on top of the 207 and you will be able to put your antenna right on the money.

The 207 can also be used to set up your antenna matcher to a precise frequency. Connect the transmatch to the input of the 207, hook up your frequency counter and tune the transmatch for minimum SWR at the desired frequency, then connect your rig and operate.

The 207 covers all frequencies from 1.7 to 33.5 MHz, so it will allow you to put any HF antenna right on the mark (including your SWL antennas).

If you do any work on HF antennas at all, this little gem is a must have for your shack. Priced at $99.95, the 207 is available from most ham dealers, or contact MFJ at P.O. Box 494, Mississippi State, MS 39762.

ARRL

The American Radio Relay League (ARRL) has always been the leader in providing the ham with up-to-date technical information. Their latest crop of books is no exception to the rule. My choices for Christmas are as follows:

W1FB's Design Notebook

Written by *MT*'s own circuit Guru, this nifty book contains dozens of practical circuits for transmitters, receivers and accessories as well as technical info on a wide variety of devices. Price is ten dollars from most ham dealers or order direct from ARRL and include $2.50 for shipping and handling.

(NOTE: The *W1FB Design Notebook II* will be available in November. This will be an all new book with new and different circuits. Price unknown at this time.)

Antenna Compendium (Volume 2)

Antenna experiments featuring practical antenna construction and new techniques are provided by a wide variety of authors. Each design is thoroughly discussed and laid out in a manner that makes them easy to duplicate for the average amateur. Especially interesting are the designs for phased arrays on 160 through 40 meters. Small lot owners will be interested in the antenna on page 103. Many new worthwhile ideas are presented in this manual. Features on solar activity and ionospheric effects help the amateur understand how the sun affects propagation. I find it extremely interesting reading and would have paid the $12.00 price for the cover photograph alone.

Antenna Handbook

This will give you the complete works on antennas. Covering every aspect from antenna theory to design, there is not a better manual available for the average amateur on antennas.

You name it and it will be found in the *Antenna Handbook*, from compact, space-saving antennas to huge arrays requiring acres to construct; or from VLF to microwaves. If you like antennas and want to know how they work and how to build them, this is the book for you. In fact, I think this is one book that belongs in every ham shack! You simply will not find a more comprehensive antenna book at the price ($20.00) anywhere.

All three ARRL books are available from the ARRL, 225 Main St., Newington, CT 06111; phone (203) 666-1541. $2.50 shipping/handling required on direct orders.

HCJB 60th Anniversary

On December 6 & 7, 1991, SW broadcast station HCJB will be celebrating their 60th anniversary. To commemorate the event, HC60JB and HCJB will be transmitting on 14225, 21300 and 28500, plus or minus a few kHz. Times will be from 0300 UTC Friday Dec. 6 to 0300 UTC Dec. 8.

HCJB will be using some of the world's most powerful shortwave antennas and should be easily worked by most amateur stations.

Rob Swedin's Ham DX Tips

Well, here we are at the peak of both the DX season and the holiday season. Hopefully, you will be able to enjoy both and some of the following DX tips can help:

ASCENSION IS. One of the more difficult spots for SWL's to add to their logs, unless they check the amateur bands. Both ZD8ACJ and ZD8SE can be found on 14190 kHz (SSB) at 1800 UTC most days. You must QSL both stations via the bureau (RSGB, QSL Bureau, Box 1773 Potters Bar, Herts, EN6 3EP, U.K.) but you must mark the cards for AD8ACJ attention G3ACJ, and ZD8SE attention G3XKR. • ***AUSTRALIA*** VK3XU (D.C. Diamond, 2 Gatters Rd., Wonga Park, 3115) offers this one on RTTY on or about 14089 kHz starting at 1030 UTC daily. • ***BANGLADESH*** S21NQ is W6ZC who is on assignment here has been showing on 14005 and/or 14020 kHz CW at 2230 UTC most days. He has also been on 15 meters on or near 21335 kHz at 1600 UTC. Also you might want to check the 14256 kHz DX net at 2330 UTC. QSL to W4FRU John Parrott, P.O. Box 5127, Suffolk, VA 23435. • ***CYPRUS*** Spyros Stavinides (P.O. Box 9129, Nicosia, Cyprus) is 5B4MF and he can be logged on 3799 kHz (SSB) daily at 0100 UTC. • ***JAN MAYEN IS.*** This island located near the arctic circle can be logged 'til 12 December as LA3EX will be operating from here 'til then as JX3EX. He favors CW and has been logged on 14035 kHz at 2000 UTC daily. Reports go to his QSL manager LA5NM, M. Bjerrang, Box 210, N-9401 Harstad, Norway. • ***LIBERIA*** EL2FE (P.O. Box 140, Monrovia, Liberia) is a daily regular on 14086 kHz (RTTY) at 1900 UTC. • ***MALAYSIA*** VE3CHZ (Serge Bertizzo) has been a regular on 14090 kHz RTTY at 1330 UTC. Reports go to Serge at: 4 Persiaran Taman Junko, Kuala Lumpur 50480, Malaysia. • ***MAURITIUS*** 3B8GA (Faizal Baccus, Modern Square, Vacoas, Mauritius) has been on 14200 kHz SSB at 1130 UTC daily. • ***SOUTH SUDAN*** ST0DX continues to offer this country to those who need it on the following frequencies and times: 7066 kHz SSB at 0330 UTC (hams listen here and he will announce if he is listening for you in the U.S. SSB sub-bands). At 2200 UTC he can be found on 18120 kHz SSB. RTTY fans can now log this one on 14087 kHz or so starting at 2000 UTC. If you are fortunate enough to log this one, QSL his manager WA2NHA, Howard Messing, 90 Wells Dr., Wayne, NJ 07470. • ***SOUTH GEORGIA IS.*** VP8SGB has been joining the "Family Hour DX Net" on 14226.5 kHz at 1100 UTC Tuesdays. Reports go to QSL manager VK4MZ, M.M. Newman, 33 Jones St., Highgate Hill, 4101, Australia. • ***TONGA*** A35IM can be logged on 14087 kHz RTTY at 1000 UTC. A35LI offers CW contacts on 21010 kHz at 0100 UTC. A35TX offers SSB contacts on 14195 kHz at 0430 UTC. All three can be QSL'd via their QSL manager JA30IN, Tadashi Haslimoto, 40-7 Daigokuden, Kiadecho, Mukoh 617.

Happy DXing and 73 de Rob

A special QSL card will be issued for the event; reports should be sent to HCJB, 17-01-00691, Quito, Ecuador.

Space Shuttle Audio Retransmission Frequencies

Dennis Poupart in Slidell, LA sent us the list below of stations and frequencies that carry Space Shuttle audio during the Shuttle missions.

That's all for November; Happy Turkey Day, one and all. 73 de Ike, N3IK

Station	VHF	10M	15M	20M	40M	80M
W3NAN	147.45	28.650	21.395	14.295	7.185	3.860
W5RRR	146.64					
W6VIO	224.04		21.340	14.270		
W6FXN	145.46					
K6MF	145.58				7.165	3.840
NASA/JSC	171.15					
W4MWG				14.230 (SSTV)		

Call letters and transmission site:

WA3NAN	Goddard Space Flight Ctr, Greenbelt, MD	K6MF	San Francisco, CA
W5RRR	Johnson Space Center, Houston, TX	W6FXN	Los Angeles, CA
W6VIO	Jet Propulsion Laboratory, Pasadena, CA	W4MWG	Mebane, NC

outer limits

Dr. John Santosuosso

P.O. Box 1116
Highland City, FL 33846

Cuban-American Radio War Heats Up

A new anti-Castro clandestine has taken to the airwaves. It has a lengthy identification, but if you listen carefully you should be able to catch it. Look for La Voz de la Federacion Mundial de Expresos a Politicos de Cubanos on 7080 or 7085 at either 0030 or 0130. Programs are normally just under one-half hour. Perhaps recent events in the Soviet Union are encouraging new broadcasts by Cuban exiles. At present we have no address for this station.

Meanwhile Connecticut's Bob Thomas reports a relay of an anti-Castro broadcast on 0637 at 0400 UTC. This could prove revealing.

Liberation Radio in Decatur, Illinois

It is very much alive. Operator Napoleon Williams has been broadcasting to the black community of that city since August 1990. His unlicensed FM station has been an advocate for the poor and the homeless. However, he has not stayed on the air without difficulty. In October 1990 his home was raided, not by the FCC, but by 20 police officers who were heavily armed. Still, Williams continues because he feels his station has an important job to do.

Napoleon Williams says those readers who would like to do so can contact him at 756 S. Wise, Decatur, Illinois 62522, or phone 217-422-3710. Readers of our September column will recall we reported on Black Liberation Radio of Springfield, Illinois. That station has a similar philosophy to the one run by Williams but it is a separate operation. We would welcome loggings from readers who can hear either one.

From California, Tom Reville of Radio Free Venice (which was partially inspired by Black Liberation Radio), tell us his struggle with the FCC goes on. Reville continues to refuse to pay a $1,000 fine, and in lengthy correspondence with the FCC makes the case that his constitutional rights have been violated. We noted in the September column that Reville's 20-watt station on 107.8 MHz was raided not only by two FCC agents but also by 11 Los Angeles police officers.

Across the Dial

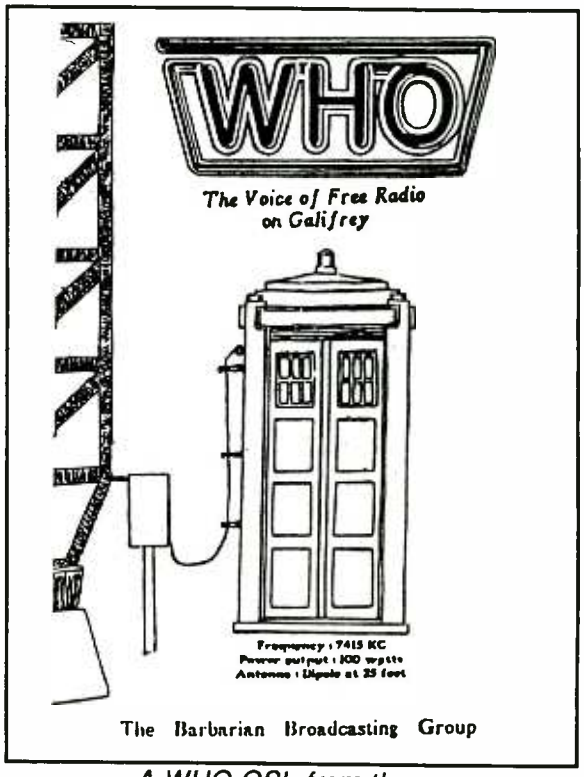
Let's take a look at what readers have been hearing recently.

• In Virginia Pat Murphy bagged himself a couple of Europirates. Ireland's **Radio Fax** made it in on 6205 at 0321. **Live Wire Radio** from England showed up on 15050 at 0100. Pat did all right in the domestic pirate department also. He found *Omega Radio* on 7415.6 in LSB at 1300 UTC.

Pat came across something strange on 6840, a frequency normally used for numbers and data transmissions from Warrenton, Virginia. On several occasions he heard rock music without any announcements for 15 to 20 minutes. Over the past four years nothing similar was heard on this frequency. Pat wonders if readers have any ideas as to what is going on.

• Steve Gutierrez is the pleased owner of a **WORK** QSL for a transmission on 7412 at 0304. Congratulations, Steve, on your first pirate QSL.

• In Pennsylvania, William Rake has been busy. Among others, he found **KXKVI Interplanetary Radio** on 7415 at 0401. **Revolutionary Voice of Plainville** showed up on 7416 at 0158. QSLs have arrived from **He-Man Radio** and **Radio Wolf International.**



A WHO QSL from the collection of Alan Masyga.

• Out in California regular reporter Skip Harwood has logged a real oddity. It is a station he caught recently on 7406 kHz at 0400. For that broadcast it used the call **KCRN**. However, every time it transmits it changes its call letters. Among others used in the past are **KPUD, KCAN, KLOG**, and **KPN-36.**

• Minnesota's Alan Masyga continues to have great success. Recent QSLs include **K2KTS, The Voice of Bono, WHO, Hope Radio,** and the **Radio Beaver**. Among his logs are **Chicago Tunnel Company** on 7412 at 0112, **Tube Radio** on 7416 at 1116, **Action Radio** on 7415.6 at 0154, and the **Voice of Anarchy** on 7415 at 0222.

William Rake now owns a He-Man Radio QSL.

• William Schmitz checks in from Washington, DC, with some nice loggings and QSL results. **WKND** showed up on 7415 at 0325. **Radio Free Massachusetts** was on 7416 at 0410, and **Radio Nirvana** used 7420 at 0400. QSLs include **Tube Radio** and **He-Man Radio.**

• In Illinois Donald Wiemken did all right for himself. Among his recent logs are **Chicago Tunnel Company** on 7415 at 0049 and **Voice of Anarchy** on the same frequency at 0224.

• Up in Wisconsin Glenn Waber's log book has been filling up. He found **KXKVI Radio** tuning up on top of **WKND** at 0408 on 7415. Also on 7415 was **Revolutionary Voice of Plainville** at 0445.

• Ye editor is happy to report a QSL finally arrived from the **Northern Ireland Relay Service** for their special test to North America on 6273. Here is hoping they make more such broadcasts in the future.

A Beacon Mystery

A most interesting letter arrived from Dwight Weidman in West Virginia. He says Harry Helm's book notes a single-letter "P" beacon was believed to have been transmitting from Kaliningrad in the USSR but had been off the air for several years. However, Dwight recently logged such a beacon from 0140 to 0211.

In addition to its identifying "P," it was also transmitting CW numbers groups and RTTY. I wonder if the almost unbelievable changes in the USSR have any connection with this. Dwight, what frequency was in use? In the past "P" has been monitored on 6203.

QSLing

I received a letter from a reader who signs himself Beau Cephus. Our friend reports very little success QSLing pirates, although he sends adequate postage, is prompt, courteous, and often includes a bumper sticker or some other item. He says even stations stated to be excellent verifiers often will not QSL his reports.

I am not sure I can offer much help, Beau Cephus, except to urge all stations to try to QSL accurate reports. Those replies mean much to listeners. My personal experience has been that probably pirates have a better QSL response rate than the licensed broadcasters do, but then there are always stations which are exceptions and those situations which are difficult to explain. One Europirate will not verify my reports, while everybody else seems to get extremely prompt replies. On the other hand, I sent one rather limited report to Radio Latvia and got a QSL, while a friend of mine is still empty-handed after seven attempts.

I would say that in writing to American pirates be sure to send three mint, first-class stamps, unless the station directs otherwise. Also, follow-ups sometimes will yield results.

Closings

David Alpert has sent some copies of recent FCC announcements of pirate closings. Fourth of July Radio is among the latest victims, and the operator was fined $1,000. The station had been transmitting from Ohio. A station in Pennsylvania which had not been using an identifier was also shut down and fined $1,000.

Other News

• Harry Baughn sent us an article from *Time* which says Cuban stations are taking listeners away from Radio Marti by broadcasting more rock and roll.

• Bob Thomas reports the pirate who was criticizing the broadcasts of WFIF in Milford, Connecticut, has been found. The operator is now being sued by WFIF. Bob says another pirate has been playing the foolish and dangerous game of broadcasting on the main frequency of the Fairfield, Connecticut, police department.

• I have heard an interesting, if one-sided, report on the tragic events in Yugoslavia from 0000 to 0010 on Radio Croatia Zagreb on 7315. This is a relay via WHRI. Most of the transmission is in Croatian, but the brief English newscasts make fascinating listening. Radio Nederland's *Media Network* says Zagreb Radio direct from Croatia is on 7240 and 9820 in Croatian 24-hours a day with a relay of the home service.

• Could Contra clandestines return? Frank McGuire keeps us up-to-date on what the CIA's Foreign Broadcasts Information Service is reporting. FBIS says the "Recontras" did make an attack on a power plant operated by the Nicaraguan Institute of Energy. Further Recontra activity is always a possibility.

Confirming Your Catch

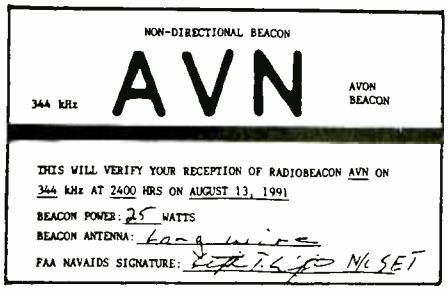
November is traditionally the month when longwave DXing gets into high gear. Not only are signals stronger, but the annoying static that plagued the band during the summer months has let up. With improved conditions finally here, it's a great time to hunt for some new beacons to add to your log. If you tuned the band during the summer but were frustrated by static, give it another try now—you may be pleasantly surprised.

Let's say you've finally logged a rare beacon from four states away. What's your next step? For many, the job isn't complete until a QSL card from the station is hanging on the shack wall. Strange as it may sound, it is possible to receive QSL cards from beacons, or rather, from the people who run them.

Verifying a beacon is much different than getting a QSL from the BBC or All India Radio. Those who operate and maintain beacons aren't in the business of offering QSLs to the listening audience. The fact is, they're doing you a favor by responding at all. Nevertheless, many beacon operators are happy to reply to a polite and informative reception report. Here's how to do it:

You must prepare your own QSL card for the beacon engineer to fill in. This is often called a prepared form card, or PFC, and is widely used by utility monitors. It doesn't have to be fancy. A little handiwork with a stencil and an index card should do the trick. The important thing is to create something that shows your genuine interest in the project. If you've gone to the trouble of making a decent card, the engineer won't want to let you down.

The card should show date, time and frequency of reception along with the location of the beacon. Leave blanks for the operator to insert a few technical details about the beacon such as antenna type, power output, etc. and a place for his/her signature.


NON-DIRECTIONAL BEACON

344 kHz **AVN** AVON BEACON

THIS WILL VERIFY YOUR RECEPTION OF RADIOBEACON AVN ON 344 kHz AT 2400 HRS ON AUGUST 13, 1991

BEACON POWER: 25 WATTS

BEACON ANTENNA: Long wire

FAA NAVAIDS SIGNATURE: [illegible] NI SET

Example of a PFC received from AVN, Avon, NY.

Include a brief, nontechnical cover letter with your card explaining that you are a radio hobbyist seeking to verify reception of the beacon noted. Ask the engineer to fill in the card and return it to you. Be sure to enclose an SASE with your request and don't forget to thank the person for his/her time.

In general your QSL request can be mailed to the airport/FAA office nearest the beacon or in the case of Coast Guard-operated beacons, to the nearest USCG facility. I've found that putting "Attn. NAVAIDS" on your envelope helps speed your letter to the proper people.

A specific address for virtually any beacon can be found in *The Aero/Marine Beacon Guide*. ($15 from 2856-G West Touhy Ave., Chicago, IL 60645.) The *Guide* explains just how to extract this information from its listings and will help prevent a disappointing "Return to sender" notice on your letter. The *Guide* also lists the beacon name, which may or may not relate to its actual location. By mentioning the beacon name in your letter, it shows you've really done your homework.

I wish you luck in chasing QSLs this season. Should you receive one you're especially proud of, send along a photocopy and you could see it here in *MT*.

Mailbag

• Several of you wrote in with corrections to the marine station list which appeared in the August column. It seems some of the stations were shown with incorrect call signs while others have discontinued LF operation altogether.

To set things straight, WMH, Baltimore, Maryland, is now inactive as are WOE, Lantana, Florida, WPD, Tampa, and WKM, West Haven, Connecticut. Also WMK should have been WKM and KNDJ should have been KNJD. Thanks to all who wrote in with the straight scoop on these stations.

Two additional coastal stations worth trying for are WLO, Mobile, Alabama, and WSC, Tuckerton, New Jersey. Look for them on 434 kHz and 482 kHz respectively.

• This month's loggings are from a list sent to me by Bob Montgomery of Levittown, Pa. He has been an active SWL for many years but said he "wanted to try something different" and that's just what brought him to longwave. Welcome aboard, Bob, we're glad to have you along.

Bob's goal for this season is to hear a beacon, any beacon, west of the Mississippi River. He's using a modified FCC Audio Meter receiver and a longwire antenna. The receiver is a tube set from the mid-1950s. He also uses a solid state preamp just ahead of the receiver. With this equipment, Bob logged these stations:

FREQ	CALL	LOCATION
189.36	TH	Colt's Neck, NJ (Lowfer)
216	CLB	Wilmington, NC
254	CAT	Chatham, NJ
285	EUD	York, PA, Airport
307	R	Snug Harbor, ONT
323	GTN	Wash National Airport
328	BZJ	Ft. Indiantown Gap, PA (Army)
332	LG	LaGuardia Airport, NY
347	PJN	Patterson, NJ
379	GKQ	Newark, NJ, Airport
396	NEL	Lakehurst, NJ
400	AB	Allentown, PA, Airport

Taking the R71 below 100 kHz

Judging from the number of logs I receive from people using the ICOM R71 receiver, this trick described by Bob Parnass, AJ9S, should be quite popular. It allows the R71 to tune below 100 kHz. Of course, I can't guarantee this technique will work with all versions of the radio but it's certainly worth trying if you own an R71. Let me know how it works for you. Here goes:

1. If all 32 memory channels are full, use the FUNC and CLEAR buttons to clear a memory channel.

2. Place the VFO/M switch into the M (memory) position.

3. Using all the manual dexterity you can muster, rock the main tuning knob back and forth while simultaneously rocking the Memory-CH rotary control to switch back and forth between a memory channel with a frequency in it and a clear memory channel. Continue rocking both controls until a frequency of 0.000.0 appears on the digital display.

4. Press the WRITE button. This stores the 0.000 MHz frequency in a memory channel.

You can now rotate the main tuning knob clockwise to tune up from 0.000 MHz to the frequency you want. Be careful: if you rotate the main tuning knob counter-clockwise, the radio will immediately revert to 29.999 MHz.

To tune below 100 kHz in the future, just recall the 0.000 MHz frequency from the memory channel and use the tuning knob to tune upward. That way, you don't have to use two hands every time you tune to a VLF frequency. Many thanks to *DX Ontario*, the journal of the Ontario DX Association, for providing this useful tip.

Have a Happy Thanksgiving. I'll see you here next month.

Jack Albert

Cape Town RTTY

Robert Hall in Cape Town, South Africa, shares his loggings from the other side of the globe. Unfortunately, I didn't have enough room to include all his comments, but you will find the last several—the Soviet ships—quite interesting.

You'll notice Robert logged unstandard shifts and baud rates, perhaps due to use of the auto tune/baud feature on his M7000. It's alright to use this setting; however, it can cause a problem if the received signals are already using a standard rate. Some of his notes indicated he was able to copy some text but the remaining appeared to be "coded." If he had used the r8n key to set the baud to the nearest standard rate, what appeared to be coded probably would have been in the clear.

As he copied the signals, I believe he looked up the frequency in the Klingenfuss *Guide To Utility Stations*. This is a good practice to follow, as it helps you maintain an accurate log.

NNN

FREQ kHz	LOCATION	CALL	MODE	SHIFT	COMMENTS
4056	Cameroons	TJK	RTTY	50/420n	RYs
4174	RSA	ZCS	SITOR A		QSX 4353.5
4353.5	RSA	ZCS	SITOR B		
4464.5	Cameroons	TJK	RTTY	50/555n	RYs
4570	Germany	DHJ51	RTTY	100/743n	Grengel Meteo, D
4704	Spain	AOK	FAX	120/576	USN Rota
5020	Russia	RWW74	RTTY	50/1022	Moscow
5804	Ghana	9GC	RTTY	50/417n	RYs
6902.5	USA	KWAN KWAN	RTTY	75/850	Carswell AFB TX
7750	Russia	RAW78	FAX	90/576n	Moscow
10256.5	Guam	NPN	FAX	120/576n	USN Apra Harbor
10292.3	Azores	CSY52	RTTY	50/156n	Santa Maria Air
10,390	?	?	SITOR		Interpol
10492	Senegal	RFTJ	ARQ-M2	96/850	Dakar
10554.5	Australia	AX134	FAX	120/576n	Darwin Meteo
10610	Egypt	SUA30	RTTY	45/316r	MENA Cairo
10805	Argentina		RTTY	75/850	NA Buenos Aires
10829.5	?		ARQ-E3		Phasing, no text
10865	USA	NMN	FAX	120/567	USN Norfolk
10,893.7	Argentina	LRB39	RTTY	50/850r	Saporiti, BA
10916	Dakar	RFTJ	ARQ-M2	96/850	Cde V
12265	Beijing	BZR62	RTTY	50/762	News English
12658	Chile	CCS	RTTY	75/170	Santiago Naval
12728	Diego Garcia	NKW	FAX	120/576n	
12729.8	USA	NMC	FAX	120/576n	USCG S.F.
12776.9	Japan	NDT	FAX	120/576n	USN Yokosuka
12906	UK	GYA	RTTY	75/850r	RN London
13538	RSA	FAPR	FAX	120/576n	Pretoria Meteo
13542	RSA	FAPR	RTTY	75/450	Pretoria Meteo
13597	Japan	JMH4	FAX	120/576n	Tokyo
14420	Gabon	RFTJD	ARQ-E	72/522	Libreville C de V
14460	Port Bouet	RFTJF	ARQ-E3	48/850	France C de V
14737	Russia	RXO72	FAX	90/576	Khagavovsk Meteo
14,764	Bolivia	AGM90	RTTY	75/450r	GNA Manama
14801.8	Martinique	RFJI	ARQ-E3	100/450r	FDF C de V
14802	Reunion	RFVI	ARQ-E3	96/425	St. Denis
14785.5	Delhi	ATP65	RTTY	50/374n	India news, Eng.
14925	Senegal	RFFLCS	ARQ-M2	96/850	Dakar to RFTD
14936	Gulf ?	?	SITOR A	——	USN Marsgrams
14949	Russia	RWM79	RTTY	100/425r	APN Moscow
14989	Congo	TNL77	RTTY	50/425	Brazzaville Meteo
15935	Egypt	SUA291	RTTY	50/308	MENA Cairo news
16000	Morocco	CNM69	RTTY	50/450	News, French
16014	Jibouti	RFQP	ARQ-E3	100/450	French
16183	Unidentified	?	RTTY	50/450	New Delhi Meteo
16202	Kenya	?	RTTY	50/850	Nairobi Air
16224	Taiwan	3MA35	RTTY	50/850	CNA Taipei
16323	Gabon	RFTJD	ARQ-M2	96/850	tfc frm COMAIR
16927	Russia	UJY	RTTY	50/170	
16965	RSA	ZSC	RTTY	75/170	Capetown R weather
17022.5	USA	WLO	SITOR B	–/170	tfc list
17206.5	RSA	ZCS	SITOR B	–/170	Capetown wx wrning
17271	?	?	SITOR A	–/170	coded YFASY FAJ
17430	PRL	BZG48	RTTY	50/450r	Beijing news, Fr.
18029	Zaire	Unid	RTTY	50/170r	tfc in French
18,035	RSA	ZR4	RTTY	75/850	RSA Naval RYs
18050	Russia	RQV70	RTTY	50/425	TASS Moscow
18105	?	?	SITOR A		tfc in Fr & crypto
18177	?	?	Piccolo	?	? Embassy
18238	RSA	FAPR	FAX	120/576r	wx charts
18264	Vietnam	XVN48	RTTY	50/450r	news English
18363.5	Zaire	9PL	RTTY	75/850r	RYs
18365	Senegal	6ww	RTTY	75/850	FF Dakar coded
18441	Japan	JMJ5	FAX	120/576p	Tokyo Meteo
18448	Chad	RFFVAD	ARQ-M2A	200/325	FF N'Djamena
18544	Martinique	RFLI	ARQ-E3	100/450	FEF C de V
19012	Belgium	OST	SITOR A		Ostende w/tfc
19021.8	Libya	?	SITOR A		Pakistan Embassy
19117.6	Indonesia	?	SITOR A		MFA Jakarta
19146	Jibanti	RFQP	ARQ-E3	192/450	FF Jibanti C de V
19516	?	?	RTTY	96/170r	Unid
19980	Tehran	9BC33	RTTY	50/528r	IRNA news, English
20108.4	Hawaii	PHWR	RTTY	75/850r	Hickam AFB wx
20302	Diego Garcia	NKW	FAX	129/576	USN
20330	Cyprus	MKD?	Piccolo		RAF
20408	Nigeria	?	SITOR A		Indonesian Embassy
20734	Switzerland	4UZ	SITOR A		UNO Geneva
20845	Jibonti	RFQPDE	ARQ-M2A	200/348	FF C de V
20960	Singapore		RTTY	50/850n	Kyodo news, Eng.
21858	Paris	RFFVAD	ARQ-M2A	200/425	to Djamena C de V
21858	Norway	?	SITOR A		MFA Oslo, Norway
21865	?	?	?	96/505	? strong signal
22221	?	UFXX	RTTY	50/170n	RTMS ASTAN KESAN
22390	Martinique	FUF	RTTY	75/850r	FDF
22565	Holland	PCH75	SITOR A		tfc in English
22566	Singapore	9VG84	SITOR A		tfc
22568	USA	WLO	SITOR A		tfc
22573.5	USSR	UJY	RTTY	50/170n	weather bulletins
22593	RSA	ZSC	SITOR B		Capetown tfc list
25077.3	?	UTDO	RTTY	50/155n	SovShip Kolenkow w sat trac data
25077.3	?	UJOB	RTTY	50/170	SovShip Krymskie
25088.8	?	UUIV	RTTY	50/157n	SovShipGen Petrows
24712	Senegal	RFTJC	ARQ-E3	192/450	Paris

ANTIGUA

Radio Deutsche Welle relay, 6040 kHz. Full data German map card, verified by Pete Senger. Received in 67 days for an English report. Station address; North American Service, P.O. Box 10 04 44, W-5000, Cologne 1, Federal Republic of Germany. (Nicholas Adams, Newark, NJ)

BONAIRE

Radio Netherlands, 15560 kHz. Full data scenery card, without verification signer. Received in 33 days for an English report. Station address: P.O. Box 222, 1200 JG Hilversum, The Netherlands. (Adams, NJ)

CUBA

Radio Havana, 15435 kHz. Full data Government House QSL card and station souvenirs, without verification signer. Received in 137 days for an English report. Station address: Apartado 6240, La Habana, Cuba. (Ed Mayberry, Cedar Park, TX)

CZECHOSLOVAKIA

Radio Prague Int'l, 5930/7345/9540 kHz. Full data scenery QSL card, with illegible signature and station souvenirs. Received in 19 days for an English report. Station address: English Language Broadcast, Vinohradska 12, 120 99 Prague 2, Czechoslovakia. (Adams, NJ) (Robert Landau, Secaucus, NJ)

GABON

African #1, 4830/15475 kHz. Full data verified letter and logo cards, without verification signer. Received in 15/24 months for a French report. Station address: Boite Postal 1, Libreville, Republique Gabonaise. (Landau, NJ)

HUNGARY

Radio Budapest, 9835 kHz. Full data scenery QSL card, without verification signer. Received in 29/92 days for an English report. Station address: English Section, Broday Sander u.5-7, Budapest 1800 Hungary. (Carson, OK) (Adams, NJ)

INDIA

All India Radio, 11715 kHz. Full data QSL card and souvenirs, without verification signer. Received in 58 days for an English report. Station address: P.O. Box 500, New Delhi 11001, India. (Mayberry, TX)

MADAGASCAR

Radio Netherlands relay, 15570 kHz. Full data QSL, without verification signer. Received in 49 days for an English report and one IRC. Station address: P.O. Box 222, 1200 JG Hilversum, Netherlands. (Carson, OK)

MALAYSIA

Voice of Malaysia, 15295 kHz. Partial data verified letter with illegible signature. Also received a blank QSL card, pennant and schedule. Received in 68 days for an English report. Station address: P.O. Box 11272, 50740 Kuala Lumpur, Malaysia. (Landau, NJ)

SHIP TRAFFIC

ALGOWOOD-VCTD (bulk carrier). Full data prepared QSL card stamped with ship's seal and verified by Maurice L. Richardson. Received in 27 days for an English utility report and a self-addressed stamped envelope. Ship address: c/o Marine Post Office, Detroit, Mich. 48222. (Russ Hill, Ferndale, MI)

CHARLESTON-KNJF (tanker), 156.65 kHz. Full data personal note. Received in nine days for an English utility report and first class mint postage. Ship address: Avon Steamship Company, Inc., 2001 Marcus Avenue-ste N215, Lake Success, N.J. 11042. (Hank Holbrook, Dunkirk, MD)

LE FRENE No. 1-VZGX (tanker) 156.500 kHz. Full data prepared QSL card stamped with ship's seal and verified by L.A. Hatfield. Received in eight days for an English utility report and a stamped self-addressed envelope. Ship address: c/o Marine Post Office, Detroit, Mich. 48222. (Hill, MI)

MIDDLETOWN-WR3225 (bulk carrier) 156.400 kHz. Full data prepared QSL card with company's stamp, verified by Donald Kolacz, captain. Received in 11 days for an English utility report and a self-addressed stamped envelope. Ship address: c/o Marine Post Office, Detroit, Mich. 48222. (Hill, MI)

ROLLON-SXOZ (cargo vessel) 15665 MHz. Full data two-page letter and photos of ship. Received in 99 days for an English utility report and one U.S. dollar. Ship address: Antares Shipping Company, Ltd., Knollys House, 9-12 Byward St., London EC3R 5EP, United Kingdom. (Holbrook, MD)

SEAWAY QUEEN-VDDL (bulk carrier) 156.600 MHz. Full data prepared QSL card stamped with ship's seal and verified by Wayne Buckland, captain. Received in 14 days for an English utility report and a self-addressed stamped envelope. Ship address: c/o Marine Post Office, Detroit, Mich. 48222. (Hill, MI)

STAR MISSISSIPPI-KWEQ (tanker) 500 kHz. Full data prepared QSL card and notes from ship's radio log on date heard. Received in 26 days for an English utility report and first class mint postage. Ship address: Texaco, Inc., 2000 Westchester Ave., White Plains, N.Y. 10650. (Holbrook, MD)

SWITZERLAND

Swiss Radio International, 6135 kHz. Full data color photo QSL without verification signer. Received in 28 days for an English report and one IRC. Station address: CH-3000 Berne 15, Switzerland. (Adams, NJ)

UNITED ARAB EMIRATES

UAE Radio-Abu Dhabi, 17855 kHz. Full data letter QSL verified by Ahmed A. Shouly, director. Received in 45 days for an English report on a postcard. Station address: P.O. Box 63, Abu Dhabi, United Arab Emirates. (Stephen Hunter, Drexel Hill, PA)

UNITED STATES

WKPE-1170 kHz AM. Full data QSL form letter verified by Steve Binder, assistant engineer. Received in 68 days for an English AM report and first class mint postage. Station address: Radio Center, Orleans, Mass. 02653 (Holbrook, MA)

WJTZ-640 kHz AM. Full data QSL letter verified by Mitch Sandidge, C.E. Received in 14 days for an English AM report and first class mint postage. Station address: 640 Radio Way, Blountville, Tenn. 37617. (Holbrook, MD)

WSML-1200 kHz AM. Full data prepared QSL card verified by Olin D. Campbell P.D. Received in 118 days for an English AM report and first class mint postage. Station address: Box 900, Graham, N.C. 27258. (Holbrook, MD)

WBBD-1600 kHz AM. Full data prepared QSL card verified by Michael Dunninger, assistant engineer. Received in eight days for an English AM report and first class mint postage. Station address: 98 16th St., Box 6273, Wheeling, W.V. (Holbrook, MD)

USSR-LITHUANIAN SSR

Radio Vilnius, 7400 kHz. Full data Land of Amber QSL card, without verification signer. Received in 167 days for an English report. Station address: Konarskio 49, Vilnius 232674 Lithuania USSR. (Adams, NJ)

USSR-UKRAINIAN SSR

Radio Kiev, 7400 kHz. Full data QSL card and station souvenirs, without verification signer. Received in five months for an English report. Station address: English Service, Kiev, Ukraine, USSR. (Landau, NJ)

USSR-UZBECK SSR

Radio Tashkent, 11975 kHz. Full data QSL card and station souvenirs, without verification signer. Received in 48 days for an English report. Station address: 49 Khorezm St., Tashkent, USSR. (Mayberry, TX)

YUGOSLAVIA

Radio Yugoslavia, 9620/11735 kHz. Full data QSL card and station souvenirs, without verification signer. Received via surface mail in 81 days for an English report. Station address: P.O. Box 200, Hilendarska 2, 11000 Belgrade, Yugoslavia. (Mayberry, TX)

This QSL received from Radio Kiev features the Ukrainian Palace of Culture

MT Monitoring Team

Greg Jordan
Frequency Manager
P.O. Box 98
Brasstown, NC 28902

Kannon Shanmugam
Program Manager
P.O. Box 98
Brasstown, NC 28902

Dave Datko
California

Jack Hubby
California

John Carson
Oklahoma

B. W. Battin
New Mexico

Tammy Wells
Maine

Jim Frimmel
Texas

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 Standard Time) 5,6,7, or 8 hours for Eastern, Central, Mountain, or Pacific Time, respectively.

Note that all dates, as well as times, are in UTC: for example, the BBC's "Ken Bruce Show" (0030 UTC Sunday) will be heard on Saturday evening (7:30 PM Eastern, 4:30 PM Pacific) in North America, not on Sunday.

2: Choose a program or station you want to hear.

Some selected programs appear on the lower half of the page for prime listening hours. If it's news you're interested in, check out the complete "Newsline" listing, which begins on the next page.

Occasionally program listings will be followed by "See X 0000." This information indicates that the program is a re-run, and refers to a previous summary of the program's content. The letter stands for a day of the week, as indicated below, and the four digits represent a time in UTC.

S: Sunday
M: Monday
T: Tuesday
W: Wednesday
H: THursday
F: Friday
A: SAturday

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.

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.

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

Of course, every station can't be heard all the time. To help you find the right frequency, we've included information on the target area of each broadcast. Frequencies beamed toward your area will generally be easier to hear than those beamed elsewhere, even though the latter will often still be audible. Every frequency is followed by one of these target codes:

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

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

English language **shortwave guide**

newsline

"Newsline" is your guide to news broadcasts on the air. ■ All broadcasts are world news reports unless followed by an asterisk, which means the broadcast is primarily national news. ■ All broadcasts are daily unless otherwise noted by the day codes.

0000 UTC
(7:00 PM EST, 4:00 PM PST)

BBC
CBC, Northern Quebec [A]
Christian Science Monitor
Radio Australia
Radio Beijing
Radio Canada Int'l [S-M]
Radio Finland [M-F]
Radio Havana Cuba [T-S]
Radio Korea
Radio Luxembourg
Radio Moscow
Radio New Zealand Int'l [M-A]
Radio Prague Int'l
Radio Sofia
Radio Thailand
Radio Vilnius
Spanish Foreign Radio
Voice of America
0005
Radio Pyongyang
0010
Radio Beijing*
BRT, Brussels
Christian Science Monitor (Asia) [M]
Christian Science Monitor [T-F]
HCJB
Radio Havana Cuba [T-S]
Radio Netherlands [T-S]
Radio New Zealand Int'l [M-F]
Voice of America (Americas, East Asia) (Special English) [T-S]
Voice of America (East Asia) (Special English) [M]
Radio Korea (News Service)
WRNO [W, F]

0100 UTC
(8:00 PM EST, 5:00 PM PST)

All India Radio
BBC
CBC, Northern Quebec
Christian Science Monitor
Deutsche Welle
FEBC Radio Int'l, Philippines
Radio Australia
Radio Belize
Radio Canada Int'l [S-M]
Radio Havana Cuba [T-S]
Radio Japan
Radio Kiev
Radio Luxembourg
Radio Moscow
Radio New Zealand Int'l [M-A]
Radio Prague Int'l
Radio Thailand
Radio Yugoslavia
Radiotelevisione Italiana
RAE, Buenos Aires [T-A]
Spanish Foreign Radio
Voice of America
Voice of Indonesia
WWCR [T-A]
0115
Radio Havana Cuba* [T-S]
0130
Christian Science Monitor (Asia) [M]
Christian Science Monitor [T-F]
Radio Austria Int'l
Radio Havana Cuba [T-S]
Voice of Greece [M-A]
0155
Voice of Indonesia
WRNO [W, A]

0200 UTC
(9:00 PM EST, 6:00 PM PST)

BBC
CBC, Northern Quebec [S-M]
Christian Science Monitor
Deutsche Welle
FEBC Radio Int'l, Philippines
Radio Australia
Radio Canada Int'l [T-A]
Radio Havana Cuba [T-S]
Radio Luxembourg
Radio Moscow
Radio New Zealand Int'l [M-F]
Radio Romania Int'l
Radio Thailand
Swiss Radio Int'l
Voice of America
Voice of Free China
Voice of Myanmar
WWCR [T-A]
0215
Radio Cairo
Radio Nepal
0230
Christian Science Monitor (Africa, Europe) [M]
Christian Science Monitor [T-F]
HCJB
Radio Havana Cuba [T-S]
Radio Moscow
Radio Pakistan (Special English)
Radio Portugal [T-A]
Radio Tirana, Albania
0245
Radio Korea (News Service)

0300 UTC
(10:00 PM EST, 7:00 PM PST)

BBC
CBC, Northern Quebec [T-S]
Christian Science Monitor
Deutsche Welle
Radio Australia
Radio Bahrain
Radio Beijing
Radio Belize
Radio Budapest
Radio Havana Cuba [T-S]
Radio Japan
Radio Moscow
Radio New Zealand Int'l [M-F]
Radio Prague Int'l
Radio Thailand
Voice of America
Voice of Free China
WWCR [T-A]
0309
BBC*
0310
Radio Beijing*
0315
Radio Cairo
Radio Havana Cuba* [T-S]
0330
BBC (Africa)*
Christian Science Monitor (Africa, Europe) [M]
Christian Science Monitor [T-F]
Radio Bahrain
Radio Havana Cuba [T-S]
Radio Netherlands [T-S]
Radio Tirana, Albania
UAE Radio, Dubai
0340
Voice of Greece [M-A]
0350
Radio For Peace Int'l [T-A]
Radio Yerevan
Radiotelevisione Italiana
0355
Radio Japan [M-F]

0400 UTC
(11:00 PM EST, 8:00 PM PST)

BBC
CBC, Northern Quebec
Christian Science Monitor
Deutsche Welle
Radio Australia
Radio Bahrain
Radio Beijing
Radio Canada Int'l
Radio Havana Cuba [T-S]
Radio Moscow
Radio New Zealand Int'l [M-F]
Radio Prague Int'l
Radio Romania Int'l
Radio RSA
Radio Sofia
Radio Tanzania
Radio Thailand
Swiss Radio Int'l
Voice of America
Voice of Turkey
WRNO [F]
WWCR [T-S]
0405
Radio Pyongyang
0410
Radio Beijing*
0425
Radiotelevisione Italiana
0430
Christian Science Monitor (Africa, Europe, NE Asia) [M]
Christian Science Monitor [T-F]
Radio Bahrain
Radio Botswana
Radio Havana Cuba [T-S]
Radio Tirana, Albania
0450
Radio RSA
0455
WYFR (Network) [T-A]

0500 UTC
(12:00 AM EST, 9:00 PM PST)

BBC
CBC, Northern Quebec [T-S]
Christian Science Monitor
Deutsche Welle
HCJB
Radio Australia
Radio Bahrain
Radio Beijing
Radio Havana Cuba [T-S]
Radio Japan
Radio Lesotho
Radio Moscow
Radio New Zealand Int'l [M-F]
Radio Thailand
Spanish Foreign Radio
Voice of America
0510
Radio Beijing*
Radio Botswana
0515
Radio Canada Int'l [M-F]
Radio Havana Cuba* [T-S]
0530
BBC (Africa)*
Christian Science Monitor (Africa, Europe, NE Asia) [M]
Christian Science Monitor [T-F]
Radio Austria Int'l
Radio Havana Cuba [T-S]
Radio Moscow (World Service)
Radio Romania Int'l
Radio Thailand
UAE Radio, Dubai
Voice of Nigeria
0550
Radio For Peace Int'l [T-A]

0600 UTC
(1:00 AM EST, 10:00 PM PST)

BBC
CBC, Northern Quebec
Christian Science Monitor
Deutsche Welle
Radio Australia
Radio Bahrain
Radio Havana Cuba [T-S]
Radio Moscow
Radio New Zealand Int'l [M-A]
Voice of America
0605
Radio Pyongyang
0610
Voice of Malaysia
0630
BBC (Africa)*
Christian Science Monitor [M-F]
Radio Havana Cuba [T-S]
Radio Moscow (World Service)
Radio Polonia
Radio Tirana, Albania
RTV Congolaise, Brazzaville [M-F]
Swiss Radio Int'l
Voice of Nigeria
0640
Radio Prague Int'l
0645
Radio Romania Int'l

0700 UTC
(2:00 AM EST, 11:00 PM PST)

BBC
Christian Science Monitor
Radio Australia
Radio Havana Cuba [T-S]
Radio Japan
Radio Moscow
Radio New Zealand Int'l [M-F]
Radio Tirana, Albania
SLBS, Freetown, Sierra Leone
Voice of Free China
Voice of Myanmar
0715
Radio Havana Cuba* [T-S]
0730
BBC (Africa)* [M-A]
BRT, Brussels
Christian Science Monitor [M-F]
HCJB
Radio Austria Int'l
Radio Finland [M-A]
Radio Havana Cuba [T-S]
Radio Moscow (World Service)
Radio Netherlands [M-A]
Radio Prague Int'l
Radio Sofia
Swiss Radio Int'l
0755
Radio Japan [M-F]

0800 UTC
(3:00 AM EST, 12:00 AM PST)

BBC
Christian Science Monitor

newsline

Radio Australia
Radio Bahrain
Radio Korea
Radio Moscow
Radio New Zealand Int'l
Radio Pakistan
SLBS, Freetown, Sierra Leone
Voice of Indonesia
0805
Radio Pyongyang
0810
Voice of Malaysia
0830
Christian Science Monitor [M-F]
Radio Moscow (World Service)
Radio Netherlands [M-A]
Swiss Radio Int'l
0840
Voice of Greece [M-A]
0855
Voice of Indonesia

0900 UTC
(4:00 AM EST, 1:00 AM PST)

BBC
Christian Science Monitor
Deutsche Welle
Radio Australia
Radio Bahrain
Radio Beijing
Radio Finland [M-F]
Radio Japan
Radio Moscow
Radio New Zealand Int'l [S-F]
Voice of Nigeria
0910
Radio Beijing*
0915
Radio Korea (News Service)
0930
Christian Science Monitor [M-F]
Deutsche Welle (Africa)* [M-F]
Radio Finland [T-A]
Radio Moscow
0950
Radio For Peace Int'l [T-A]
0955
Radio Finland [M-F]
Radio Japan [M-F]

1000 UTC
(5:00 AM EST, 2:00 AM PST)

All India Radio
BBC
BRT, Brussels [M-A]
Christian Science Monitor
HCJB
Radio Australia
Radio Bahrain
Radio Beijing
Radio Moscow
Radio New Zealand Int'l
Radio Tanzania
Swiss Radio Int'l
Voice of America
1010
Radio Beijing*
1030
Christian Science Monitor [M-F]
Radio Austria Int'l [M-F]
Radio Moscow
Radio Netherlands [M-A]
UAE Radio, Dubai
Voice of Nigeria
1040
Voice of Greece [M-A]
1055
All India Radio

1100 UTC
(6:00 AM EST, 3:00 AM PST)

BBC
Christian Science Monitor
Deutsche Welle
Radio Australia
Radio Bahrain
Radio Beijing
Radio Japan
Radio Korea
Radio Moscow
Radio New Zealand Int'l
Radio Pakistan
Radio RSA
Swiss Radio Int'l
TWR, Bonaire [M-F]
Voice of America
1105
Radio Pakistan (Special English)
Radio Pyongyang
1109
BBC*
1110
Radio Beijing*
Radio Belize [T-A]
Radio Botswana [M-F]
1115
Radio Korea (News Service)
Radio Nepal
1125
Radio Belize [M]
Radio Botswana [A-S]
1130
Christian Science Monitor [M-F]
Deutsche Welle* [M-F]
Radio Austria Int'l [M-F]
Radio Korea
Radio Lesotho
Radio Moscow
Radio Netherlands [M-A]
1135
Radio Thailand
1150
Radio For Peace Int'l [T-A]
Radio RSA
1155
Radio Japan [M-F]

1200 UTC
(7:00 AM EST, 4:00 AM PST)

BBC
CBC, Northern Quebec [A-S]
Christian Science Monitor
Radio Australia
Radio Bahrain
Radio Beijing
Radio Bras, Brasilia [M-A]
Radio Canada Int'l [M-F]
Radio Jordan
Radio Moscow
Radio New Zealand Int'l [S-F]
Radio Polonia
Radio Romania Int'l
Radio Tashkent
Radio Thailand
Voice of America
WWCR [M-F]
1210
Radio Beijing*
1215
Radio Korea
1230
BRT, Brussels [S]
Christian Science Monitor [M-F]
Radio Cairo
Radio Finland [T-F]
Radio France Int'l
Radio Moscow
TWR, Bonaire [A]
1235
Voice of Greece

1300 UTC
(8:00 AM EST, 5:00 AM PST)

BBC ("Newshour")
CBC, Northern Quebec [A-S]
Christian Science Monitor
Radio Australia
Radio Bahrain
Radio Beijing
Radio Belize
Radio Canada Int'l [S]
Radio Moscow
Radio Romania Int'l
Radio Tanzania [A-S]
Radio Tirana, Albania
Radio Yugoslavia
Swiss Radio Int'l
TWR, Bonaire [S-F]
Voice of America
WWCR [M-F]
1305
Radio Pyongyang
1310
Radio Beijing*
1325
HCJB [M-F]
1328
Radio Cairo
1330
All India Radio
Christian Science Monitor [M-F]
FEBC Radio Int'l, Philippines
Radio Austria Int'l
Radio Canada Int'l
Radio Finland [M-F]
Radio Korea (News Service)
Radio Moscow
Radio Tashkent
Swiss Radio Int'l
UAE Radio, Dubai
Voice of America (Special English)
Voice of Turkey
1346
All India Radio (UN News) [A]
1355
WYFR (Network) [M-F]

1400 UTC
(9:00 AM EST, 6:00 AM PST)

BBC
BRT, Brussels [M-A]
CBC, Northern Quebec
Christian Science Monitor
Radio Australia
Radio Bahrain
Radio Beijing
Radio Belize [M-F]
Radio Canada Int'l
Radio Finland [A]
Radio France Int'l
Radio Japan
Radio Jordan
Radio Korea
Radio Moscow
Voice of America
WWCR [M-F]
1405
Radio Pyongyang
1410
Radio Beijing*
1415
Radio Nepal
1425
HCJB [M-F]
1430
Christian Science Monitor [M-F]
FEBC Radio Int'l, Philippines
Kol Israel
Radio Austria Int'l [M-F]
Radio Finland [S-F]
Radio Moscow
Radio Netherlands [M-A]
Radio Polonia
1445
BBC (East Asia) (Special English) [M-F]
Voice of Myanmar
1455
All India Radio

1500 UTC
(10:00 AM EST, 7:00 AM PST)

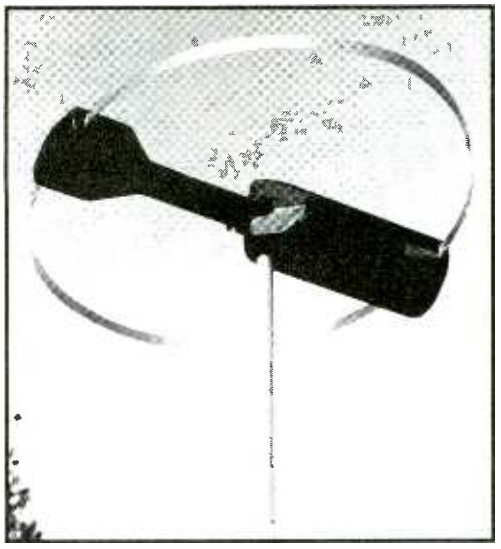
BBC
CBC, Northern Quebec [A-S]
Christian Science Monitor
Deutsche Welle
Radio Australia
Radio Bahrain
Radio Beijing
Radio Belize [M-A]
Radio Canada Int'l
Radio Japan
Radio Moscow
Radio Romania Int'l
Radio RSA
Voice of America
WWCR [M-F]
1505
Radio Finland
Radio Pyongyang
1510
Radio Beijing*
1530
Christian Science Monitor [M-F]
Deutsche Welle* [M-F]
FEBA, Seychelles
FEBC Radio Int'l, Philippines
Radio Moscow
Radio Sofia
Radio Tirana, Albania
Swiss Radio Int'l
Voice of Greece [M-A]
Voice of Nigeria
1545
Radio Korea (News Service)

1600 UTC
(11:00 AM EST, 8:00 AM PST)

BBC
CBC, Northern Quebec [A-S]
Christian Science Monitor
Deutsche Welle
Radio Australia
Radio Bahrain
Radio Beijing
Radio Canada Int'l
Radio France Int'l
Radio Jordan
Radio Korea
Radio Lesotho
Radio Moscow
Radio Pakistan
Radio Polonia
Radio Portugal [M-F]
Radio RSA
Radio Tanzania
Voice of America
Yemen Radio
1609
BBC*
1610
Radio Beijing*
Radio Botswana [M-F]
1615
Radio Pakistan (Special English)
1630
Christian Science Monitor [M-F]
Radio Austria Int'l
Radio Moscow
Radio Netherlands [M-A]
Radio Polonia
UAE Radio, Dubai
Voice of America (except Africa) (Special English)

AEA is the...

Shortwave Solution



The IsoLoop 10-30 HF antenna is designed to work in limited space applications — apartments, condos, etc. Don't be deceived by its compact size (43" diameter) — it really works! Features include: Continuous coverage from 10 to 30 MHz; narrow bandwidth to suppress out-of-band signals; comes fully assembled (no mechanical joints); much more.

For complete information on these or any other AEA products, call the toll-free InfoLine at (800)432-8873.

The PK-232MBX is a must for the digital Shortwave Listener. By far the most popular multi-mode controller ever, it can receive seven different types of data signals including Morse code, Baudot, ASCII, TDM (Time Division Multiplex), WEFAX, NAVTEX and Packet. It also features: The indispensible SIAM which automatically identifies many types of digital signals; superior software support for PC compatible, Macintosh and Commodore 64 and 128 computers.

AEA-FAX is simply the best way to demodulate multi-level grey scale fax images received by your general coverage receiver. All necessary hardware and software is included in the package which also features: On-screen tuning "scope"; Autolist feature for unattended image capture and save-to-disk; "Daisy-chain" external RS-232 input allows AEA-FAX to share a COM port with a PK-232MBX or other Hayes-compatible device; up to 16 grey levels (VGA); also supports EGA, CGA and Hercules formats; prints to HP LaserJet or Epson compatible printers.

Advanced Electronic Applications, Inc.

P.O.Box C2160 Lynnwood, WA 98036
Tech. Support/Sales (206)775-7373
Upgrade Line (206)774-1722
FAX (206)775-2340
CompuServe I.D. 76702,1013

newsline

1700 UTC
(12:00 PM EST, 9:00 AM PST)

BBC
CBC, Northern Quebec [A]
Christian Science Monitor
Radio Australia
Radio Bahrain
Radio Beijing
Radio Belize [M-F]
Radio Canada Int'l
Radio Japan
Radio Jordan
Radio Moscow
Radio RSA
Voice of America
WWCR [M-F]
1705
Radio Pyongyang
1709
BBC (Africa)* [A-S]
1710
Radio Beijing*
1715
Radio Korea (News Service)
1725
Radio Surinam Int'l [M-F]
1730
Christian Science Monitor [M-F]
Radio Moscow
Radio Romania Int'l
WYFR (Network) [A]
1735
WYFR (Network) [M-F]
1740
BBC (Africa)* [M-F]
1750
Radio RSA

1800 UTC
(1:00 PM EST, 10:00 AM PST)

All India Radio
BBC
CBC, Northern Quebec [A]
Christian Science Monitor
Kol Israel
KVOH
Radio Australia
Radio Bahrain
Radio Belize [M-F]
Radio Bras, Brasilia [M-A]
Radio Canada Int'l
Radio Korea
Radio Moscow
Radio New Zealand Int'l [S-F]
Radio Prague Int'l
Radio Tanzania
RAE, Buenos Aires [M-F]
Voice of America
1803
Radio Cote d' Ivoire, Abidjan [M-A]
1815
Radio Cote d' Ivoire, Abidjan [M-A]
1825
WYFR (Network) [A]
1830
BRT, Brussels
Christian Science Monitor [M-F]
Radio Belize
Radio Moscow
Radio Netherlands [M-A]
Radio Polonia
Radio Sofia
Radio Tirana, Albania
Swiss Radio Int'l
Voice of America (Special English)
1840
SLBC, Sri Lanka
Voice of Greece
1855
BBC (Africa)* [M-F]

1900 UTC
(2:00 PM EST, 11:00 AM PST)

All India Radio
BBC
CBC, Northern Quebec [M-F]
Christian Science Monitor [M-A]
Deutsche Welle
HCJB
KVOH
Radio Australia
Radio Beijing
Radio Canada Int'l
Radio Havana Cuba [M-A]
Radio Japan
Radio Moscow
Radio New Zealand Int'l [S-F]
Radio Tanzania
SLBS, Freetown, Sierra Leone
Spanish Foreign Radio
Voice of America
WWCR [A]
1910
Radio Beijing*
Radio Botswana
1920
Voice of Greece
1930
Christian Science Monitor [M-F]
Deutsche Welle* [M-F]
Radio Austria Int'l
Radio Finland
Radio Havana Cuba [M-A]
Radio Moscow
Radio Prague Int'l
Radio Romania Int'l
Radio Sofia
Radio Yugoslavia
Voice of Nigeria
1935
Radiotelevisione Italiana
1945
Radio Korea (News Service)
1955
WYFR (Network) [M-A]

2000 UTC
(3:00 PM EST, 12:00 PM PST)

BBC
Christian Science Monitor
Kol Israel
KVOH
Radio Australia
Radio Bahrain
Radio Beijing
Radio Belize [M-F]
Radio Havana Cuba [M-A]
Radio Moscow
Radio New Zealand Int'l [S-F]
Radio Polonia
SLBS, Freetown, Sierra Leone
Swiss Radio Int'l
Voice of America
Voice of Indonesia
Voice of Nigeria
2005
Radio Pyongyang

Andreas Gebauer and Ruth Hogarth present the BBC's new European Service.

2010
Radio Beijing*
2025
Radio Havana Cuba* [M-A]
Radiotelevisione Italiana
2030
Christian Science Monitor [M-F]
Radio Havana Cuba [M-A]
Radio Korea
Radio Moscow
Radio Netherlands [M-A]
2045
Radio Korea (News Service)
2055
Radio Finland
Voice of Indonesia

2100 UTC
(4:00 PM EST, 1:00 PM PST)

All India Radio
BBC ("Newshour")
CBC, Northern Quebec [S-F]
Christian Science Monitor [M-A]
Deutsche Welle
KVOH
Radio Australia
Radio Bahrain
Radio Beijing
Radio Belize [M-F]
Radio Canada Int'l
Radio Japan
Radio Moscow
Radio New Zealand Int'l [S-F]
Radio Portugal [M-F]
Radio Prague Int'l
Radio Romania Int'l
SLBS, Freetown, Sierra Leone
Spanish Foreign Radio
Swiss Radio Int'l
Voice of America
Voice of Turkey
2110
Radio Beijing*
2125
WYFR (Network) [M-F]
2130
Christian Science Monitor [M-F]
Radio Cairo
Radio Canada Int'l
Radio Moscow
Radio Sofia
WYFR (Network) [A]
2150
Radio For Peace Int'l [M-F]

2200 UTC
(5:00 PM EST, 2:00 PM PST)

All India Radio
BBC
BRT, Brussels
CBC, Northern Quebec [S-F]
Christian Science Monitor
Radio Australia
Radio Beijing
Radio Budapest
Radio Canada Int'l
Radio Havana Cuba [M-A]
Radio Kiev
Radio Moscow
Radio New Zealand Int'l
Radio Portugal [M-F]
Radio Prague Int'l
Radio Yugoslavia
Radiotelevisione Italiana
SLBS, Freetown, Sierra Leone
Voice of America
Voice of Free China
WWCR [M-F]
2208
Voice of America (Caribbean)* [M-F]
2210
Radio Beijing*
2225
Radio Havana Cuba* [M-A]
2230
Christian Science Monitor [M-F]
Kol Israel
Radio Finland
Radio Havana Cuba [M-A]
Radio Moscow
Radio Polonia
Radio Sofia
Radio Tirana, Albania
Swiss Radio Int'l
Voice of America (Special English)
WYFR (Network) [M-F]
2245
Voice of Greece
2255
WYFR (Network) [M-A]

2300 UTC
(6:00 PM EST, 3:00 PM PST)

BBC
CBC, Northern Quebec [M-F]
Christian Science Monitor [M-A]
Radio Australia
Radio Belize [M-F]
Radio Canada Int'l
Radio Japan
Radio Moscow
Radio New Zealand Int'l
Voice of America
Voice of Turkey
2305
Radio Polonia
Radio Pyongyang
2315
All India Radio
2320
Radio Thailand
2330
Christian Science Monitor [M-F]
Radio Moscow
Radio Tirana, Albania
Radio Vilnius
2350
Radio For Peace Int'l [M-F]
2355
Radio Japan [M-F]

Cellular Fone Fighter

Personal communications without the monthly bill.

By Don Stoner, W6TNS

I couldn't believe it! In order to buy a cellular phone, I had to sign up for a year of service—good or bad. I also had to pay a minimum charge each month, even if I didn't make a single call. And, if I did use it—their electronic cash register gobbled up 40 cents a minute!!

THEN SANITY PREVAILED

My ever practical wife doused me with a bucketful of reality. "Why do you need a cellular phone? You've got a ham license," she reasoned. "At those prices you could pay for a handheld two-way radio in a few months."

She was right—as usual. I wanted the phone to keep in touch with the family and friends. A phone in the car would save a lot of grief in an emergency. My bride reminded me that ham radio could provide all this and a lot more, so long as I didn't use it for business (that's not permitted in the Amateur Radio Service). Most important, the price was right—it was free!

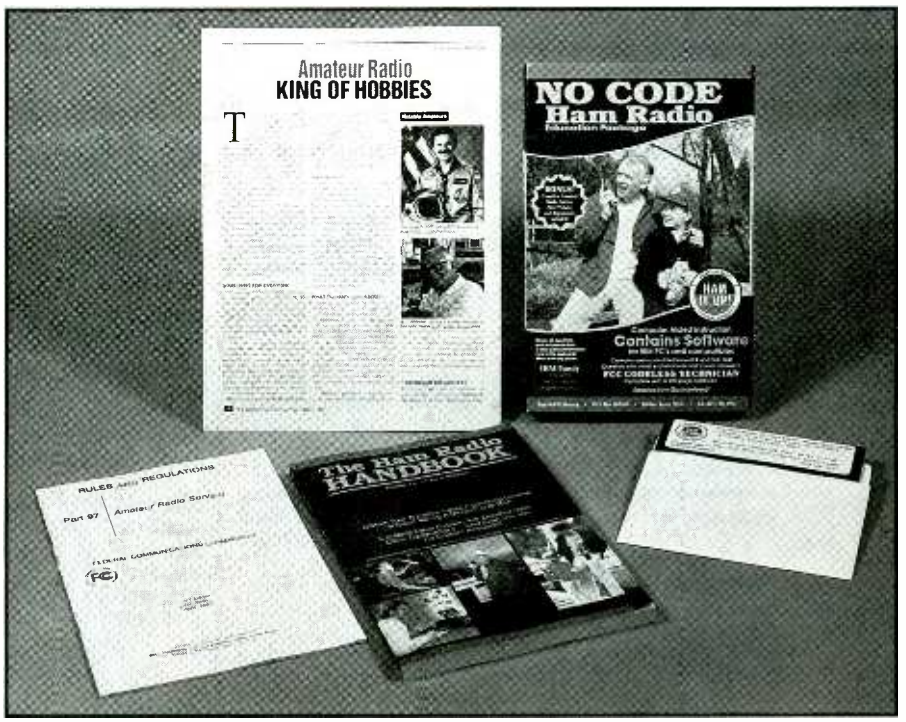
Don't confuse ham radio with CB—there's a world of difference! Amateurs use FM two-way radios for static-free, one conversation at-a-time, communication. When transmitting via mountain-top repeaters, hams communicate over ranges of a hundred miles or more using tiny radios that fit in a purse or pocket.

WANT TO MAKE NEW FRIENDS?

If so, ham radio is for you. Anyone can be a ham radio operator. There's no age restriction or nationality requirement. Other Amateurs don't care who you are or what you look like—you are just one of the many people that "hang out" on the ham bands. Amateur Radio is a great diversion for young people who need a new direction in their life.

Are you a boater? No matter where your vessel is located, you can contact an Amateur by radio. With a ham "rig" connected to your backstay, you are never out of radio contact with someone, somewhere in the world.

Ham radio is the most ideal hobby ever "invented" for retired persons. There is always someone to talk with at any hour of the day or night. With an FM two-way radio, you can have static free contact with other hams virtually anywhere you travel in the U.S.



TOO GOOD TO BE TRUE?

Sure, there's a catch. To operate a ham station, you need a license issued by the Federal Communications Commission. However, the FCC has eliminated the Morse code requirement for newcomers. You don't need to know a dot from a dash! To earn a license, all you have to do is pass a multiple choice written test. It's almost as easy as getting a drivers license—and there's no "driving test."

I've made getting a ham license even easier with a new book called ***The Ham Radio Handbook***. The book includes every question you might be asked on the written test and all the possible answers for each multiple choice question. My book also tells you which answer is correct along with some simplified theory to explain why the answer is correct.

THE DON STONER GUARANTEE

If you can earn a ham license at all, you can do it after reading my book. I'm so sure, I'll make this guarantee. If you fail your license exam after reading ***The Ham Radio Handbook***, just return everything in salable condition and I'll refund the full purchase price—including postage (proof of purchase required). You can pass the ham test and I guarantee it!!

Take advantage of my bonus education package. I'll send the book, plus IBM compatible software for testing your knowledge. It will tell you when you are ready to take your test. The program displays randomly selected questions, lets you pick the correct answer and grades your performance. Or, if you prefer, you can printout the tests. The package includes a complete list of Contact Volunteer Examiners. They can tell you where and when to take your test no matter where you live. The package contains a bonus booklet which provides all the FCC Rules and Regulations on ham radio. Another bonus is the certificate for a free copy of *The Amateur Radio Communicator,* the journal of the National Amateur Radio Association.

All this is yours if you place a free call to the National Amateur Radio Association at 1-800-GOT-2-HAM. Have your VISA or Master Card ready. Tell the operator you want the NARA Amateur Radio Educational package for $29.95 ($3.00 S&H) to any U.S. address. Or, if you just want the book, your cost is only $9.95 ($2.00 S&H) if you mention seeing this advertisement. If you prefer to send a check, write the National Amateur Radio Association, 16541 Redmond Way, Suite 232-C, Redmond, WA 98052.

Ham radio is guaranteed to influence your life and future positively.

DO IT TODAY!!

English language

shortwave guide

0000 UTC [7:00 PM EST/4:00 PM PST]

FREQUENCIES

0000-0100	ABC Brisbane	4920do	9660do		
0000-0100	ABC Perth	9610do			
0000-0100	All India Radio, Delhi	9535as	9910as	11715as	11745as
		15110as			
0000-0100	AWR Costa Rica	9725ca	11870ca		
0000-0030	BBC London	5965as	5975na	6005sa	6175na
		6195as	7145as	7325na	9580as
		9590na	9915na	11750sa	11945as
		11955as	12095na	15070na	15260sa
		15360pa	17830as		
0000-0100	CFCX Montreal	6005do			
0000-0100	CFRX Toronto	6070do			
0000-0100 twhfas	Croatian Radio, Zagreb	7315eu	9495eu		
0000-0100	CSM World Svc, Boston	7395na	9850na	13760na	17555na
		17865va			
0000-0100	FEBC Manila	15480as			
0000-0100	KTBN Salt Lake City	15590am			
0000-0100	R. for Peace Int'l	7375na	13630na	15030na	21465na
0000-0100	Radio Australia	11880va	11930va	13605va	15160va
		15240va	15320va	17630va	17715va
		17750va	17795va	21740va	
0000-0100	Radio Beijing	11705am	15110am	15285am	
0000-0030 mtwhf	Radio Canada Int'l	5960na	9755na	13760na	
0000-0100 sm	Radio Canada Int'l	5960na	9755na		
0000-0100	Radio Havana Cuba	11950am			
0000-0100	Radio Korea	15575na			
0000-0100	Radio Luxembourg	6090om	15350om		
0000-0100	Radio Moscow NAS	9480na	11690na	11710na	11730na
		11780na	11850na	11985na	12005na
		12050na	13605na	13775na	15140na
		15290na	15355na	15410na	15425na
		15480na	15550na	15570na	15580na
		15590na	15595na	16190na	17600na
		17620na	17675na	17730na	17850na
		17860na	17890na	21690na	21710na
		21790na	21845na		
0000-0100 smtwhf	Radio New Zealand Int'l	17770pa			
0000-0030 sm	Radio Norway	9645va			
0000-0030 stwhfa	Radio Prague	7345na	11685na	11990na	
0000-0100	Radio Pyongyang	11335na	13775na	15115na	
0000-0100	Radio Sofia, Bulgaria	11660eu	11710na	15110eu	15330na
		15370eu	17825na		
0000-0100	Radio Thailand	4830as	9655as	11905as	
0000-0030	Radio Vilnius, Lithuania	11675na	11790na	15180na	17665na
		17690na			
0000-0100	RTM Malaysia	7295do			
0000-0100	SBC Radio 1, Singapore	5010do	5052do	11940do	
0000-0100	SLBS, Sierra Leone	3316do			
0000-0100	Spanish Foreign Radio	9630na			
0000-0100	Voice of America	5995ca	6130ca	9455ca	9775ca
		9815ca	11580ca	11695ca	15205ca
0000-0100	Voice of America	7120as	7405as	9770as	11760as
		15185as	15290as	17735as	17820as
0000-0100	WHRI Noblesville	7315am	9495am		
0000-0100	WINB Red Lion, Penn.	15145eu			
0000-0100	WRNO New Orleans	7355am			
0000-0100	WWCR Nashville	7520na			
0000-0100	WYFR Okeechobee	5985am			
0030-0100	BBC London	5965as	5975na	6005sa	6175na
		7135as	7325na	9580as	9590na
		9915na	11750sa	11955as	12095na
		15260sa	15360pa		
0030-0100	BRT Brussels	13655na	13710na		
0030-0100	HCJB Quito Ecuador	9745am	15155am	21455am	25950am
0030-0100	Hunan PBS Changs ha China		4990do		
0030-0100	Radio Netherlands	6020am	6165am	11835am	
0030-0100	Sri Lanka B'casting CorP.	6005as	9720as	15425as	
0040-0050 twhfas	R Nacional de Venezuela	9540om			
0050-0100	Vatican Radio	6150na	9605na		

SELECTED PROGRAMS

Sundays

0005 Christian Science Monitor: Herald of Christian Science. Religious programming explaining the doctrine of Christian Science.
0010 Voice of America (Americas, Caribbean): American Viewpoints. Experts discuss provocative magazine and newspaper articles.
0010 Voice of America (East Asia): VOA Morning. Sports, science, business, music, and features about America.
0030 BBC: The Ken Bruce Show. Ken Bruce plays pop music, past and present.
0030 Voice of America (Caribbean): Weekend Magazine. Music, conversations with correspondents, and talks about the arts.
0040 Voice of America (Americas, East Asia): Words and Their Stories (Special English). Explanations of the origins of American expressions.
0045 Voice of America (Americas): American Stories (Special English). Fictional tales by great American writers.
0045 Voice of America (East Asia): VOA Morning. See S 0010.

Mondays

0005 Christian Science Monitor (Americas, Europe, Africa): The Sunday Service. See S 1605.
0006 Christian Science Monitor (SE Asia): News Features. In-depth news analyses, focusing on major International events.
0010 Voice of America (Americas, Caribbean): Encounter. See S 1210.
0010 Voice of America (East Asia): Newsline. See S 2310.
0030 BBC: In Praise Of God. Christian religious services and meditations.
0030 Voice of America (Americas, Caribbean): Spotlight. Reports and interviews on people, places, and events of interest to listeners in the Caribbean and Latin America.
0040 Voice of America (East Asia): Science Report (Special English). Developments in the world of science and technology.
0045 Voice of America (East Asia): VOA Morning. See S 0010.

Tuesdays

0006 Christian Science Monitor: News Features. See M 0006.
0010 Voice of America (Americas, East Asia): Newsline. See S 2310.
0010 Voice of America (Caribbean): Caribbean Report. The latest news, sports, financial news, and weather reports for the Caribbean.
0030 BBC: Panel Game. "Where In The World?" is a global geography quiz, featuring guests like the beloved Beeb presenter Margaret Howard (through December 3rd).
0030 Voice of America (Caribbean): Music, UA. (Standards). See M 1130.
0040 Voice of America (Americas, East Asia): Science Report (Special English). See M 0040.
0045 Voice of America (Americas): This is America (Special English). See M 1115.
0045 Voice of America (East Asia): VOA Morning. See S 0010.

Wednesdays

0006 Christian Science Monitor: News Features. See M 0006.
0010 Voice of America (Americas, East Asia): Newsline. See S 2310.
0010 Voice of America (Caribbean): Caribbean Report. See T 0010.
0030 BBC: Omnibus. Topical features on almost any topic, from Dracula to drugs.
0030 Voice of America (Caribbean): Now Music, UA. See T 1130.
0040 Voice of America (Americas): Agriculture Report (Special English). See T 1110.
0040 Voice of America (East Asia): Science Report (Special English). See M 0040.
0045 Voice of America (Americas): Science in the News (Special English). See T 1115.
0045 Voice of America (East Asia): VOA Morning. See S 0010.

Thursdays

0006 Christian Science Monitor: News Features. See M 0006.
0010 Voice of America (Americas, East Asia): Newsline. See S 2310.
0010 Voice of America (Caribbean): Caribbean Report. See T 0010.
0030 BBC: Comedy Show. See W 1530.
0030 Voice of America (Caribbean): Now Music, UA. See T 1130.
0040 Voice of America (Americas, East Asia): Science Report (Special English). See M 0040.
0045 Voice of America (Americas): Space and Man (Special English). See W 1115.
0045 Voice of America (East Asia): VOA Morning. See S 0010.

Fridays

0006 Christian Science Monitor: News Features. See M 0006.
0010 Voice of America (Americas, East Asia): Newsline. See S 2310.
0010 Voice of America (Caribbean): Caribbean Report. See T 0010.
0030 BBC: Music Feature. In "Conductors At Work," Elizabeth Francis talks to conductors about their professsion (1st/8th); John Thornley follows with "Gods And Demons" (15th/22nd/29th).
0030 Voice of America (Caribbean): Now Music, UA. See T 1130.
0040 Voice of America (Americas, East Asia): Science Report (Special English). See M 0040.
0045 Voice of America (Americas): The Making of a Nation (Special English). See H 0045.
0045 Voice of America (East Asia): VOA Morning. See S 0010.

Saturdays

0005 Christian Science Monitor: Herald of Christian Science. See S 0005.
0010 Voice of America (Americas, Caribbean): Newsline. See S 2310.
0010 Voice of America (East Asia): VOA Morning. See S 0010.
0030 BBC: From The Weeklies. A review of the British weekly press.
0030 Voice of America (Caribbean): Country Music, UA. See F 1130.
0040 Voice of America (Americas): Science Report (Special English). See M 0040.
0040 Voice of America (East Asia): Words and Their Stories (Special English). See S 0040.
0045 BBC: Recording Of The Week. See M 0545.
0045 Voice of America (Americas): American Mosaic (Special English). See F 1115.
0045 Voice of America (East Asia): VOA Morning. See S 0010.

English language **shortwave guide**

0100 UTC [8:00 PM EST/5:00 PM PST]

FREQUENCIES

0100-0200	ABC Brisbane	4920do	9660do		
0100-0200	ABC Perth	9610do			
0100-0115	All India Radio, Delhi	9535as	9910as	11715as	11745as
		15110as			
0100-0200	BBC London	5965as	5975na	6005sa	6175na
		7135as	7325na	9580as	9590na
		9915na	11750sa	11955as	12095na
		15260sa	15280as	15360pa	21715as
0100-0200	CFCX Montreal	6005do			
0100-0200	CFRX Toronto	6070do			
0100-0200	CKZU Vancouver	6160do			
0100-0200 M	Croatian Radio, Zagreb	7315eu	9495eu		
0100-0200	CSM World Svc, Boston	7395na	9850na	13760na	17555na
		17865va			
0100-0150	Deutsche Welle	6040na	6085na	6145na	11865na
		11890na	13610na	13770na	15105na
		15425na			
0100-0200	FEBC Manila	15480as			
0100-0200	HCJB Quito Ecuador	9745am	15155am	21455am	25950am
0100-0200	KTBN Salt Lake City	7510na			
0100-0130	Nat'l Radio of Laos	7112as			
0100-0200	R. for Peace Int'l	7375na	13630na	15030na	21465na
0100-0200	Radio Australia	11880va	11930va	15160va	15240va
		15320va	17630va	17715va	17750va
		17795va	21525va	21740va	21775va
0100-0130	Radio Canada Int'l	9535am	9755am	11845am	11940am
		13720am			
0100-0200 sm	Radio Canada Int'l	9535ca	9755ca	11845ca	11940ca
		13720ca			
0100-0200	Radio Havana Cuba	11950am			
0100-0200	Radio Japan	5960na	11840am	15195am	17810as
		17835am	17845as		
0100-0200	Radio Kiev	11675na	11790na	12005na	15180na
		17665na	17690na		
0100-0200	Radio Moscow	9480va	11690va	11710na	11780va
		11850na	11920va	11980va	12005va
		12050va	13605va	13775va	15140va
		15290va	15315va	15410va	15425va
		15480va	15550va	15580va	15590va
0100-0200	Radio Moscow	9600na	9685na	9720na	11730na
		11750na	15595va	16190va	17600va
		17605na	17620va	17730va	17850va
		17860va	17890va	21635va	21690va
		21790va	21845va		
0100-0125	Radio Netherlands	6020am	6165am	11835am	
0100-0200	Radio New Zealand Int'l	17770pa			
0100-0130 SM	Radio Norway	9605na			
0100-0130	Radio Prague	5930na	7345na	11685na	
0100-0130	Radio Sweden	9765as	9695na	11705na	
0100-0200	Radio Thailand	4830as	9655as	11905as	
0100-0120	RAI, Rome	9575am	11800am		
0100-0200 smtwh	RTM Malaysia	7295do			
0100-0200	SBC Radio 1, Singapore	5052do	11940do		
0100-0200	SLBS, Sierra Leone	3316do			
0100-0200	Spanish Foreign Radio	9630na			
0100-0200	Sri Lanka B'casting Corp.	6005as	9720as	15425as	
0100-0105	Vatican Radio	6150na	9605na		
0100-0200	Voice of America	5995ca	6130ca	9455ca	9775ca
		9815ca	11580ca	15205ca	
0100-0200	Voice of America	6095va	6125va	7115as	7170as
		7205as	7405as	11705as	15120as
		15160as	15250as	17740as	21550as
0100-0200	Voice of Indonesia	7125as	9675as	11752as	11785as
0100-0200	WHRI Noblesville	7435am			
0100-0200	WINB Red Lion, Penn.	15145na			
0100-0200	WRNO New Orleans	7355na			
0100-0200	WWCR Nashville	7520na			
0100-0200	WYFR Okeechobee	6065na	9505na	11855na	15440na
0130-0200 mwf	Alma Alta Radio, Khazak.	5035do	5915do	6135do	
0130-0200	Radio Tashkent	7335na			
0130-0200	RAI Vienna	9870sa	9875na	13730na	
0130-0200	UAE Radio, Dubai	11795na	13695eu	15320eu	15435eu
0130-0140 mtwhfa	Voice of Greece	9395am	9420am	11645am	
0145-0200	Vatican Radio	7125as	9650as	11750as	11890as

SELECTED PROGRAMS

Sundays

0101 BBC: Play Of The Week. This month's drama: "Secret Rapture" (3rd, starts at 0030 UTC); "Dark Star" (10th); "Peer Gynt" (17th/24th).
0105 Christian Science Monitor: Herald of Christian Science. See S 0005.
0110 Voice of America (Americas, Caribbean): Communications World. A look at modern telecommunications.
0110 Voice of America (South Asia): VOA Morning. See S 0010.
0130 Voice of America (Americas, Caribbean): Press Conference, UA. Correspondents ask questions of newsmakers.

Mondays

0101 BBC: Feature/Drama. Try your hand at "Updating The UN Charter" (4th/11th); "Lines In The Sand" looks at life in the Gulf after the War (18th); the world's big political crises are examined on "Conflicting Opinions" (through December 16th).
0106 Christian Science Monitor (SE Asia): Monitor Radio Worldwide. General features on a wide variety f subjects.
0110 Voice of America (Americas, Caribbean): New Horizons. See S1110.
0110 Voice of America (South Asia): Newsline. See S 2310.
0130 Voice of America (Americas, Caribbean): Issues in the News. See S 1130.
0130 Voice of America (South Asia): VOA Morning. See S 0010.
0134 Christian Science Monitor (SE Asia): Letterbox. Staff members respond to listener letters.
0145 BBC: Classical Music. This month, the ongoing re-run of "Cole Porter Among Friends" (through December 2nd).
0148 Christian Science Monitor (SE Asia): Religious Article. A reading from The Christian Science Monitor.

Tuesdays

0105 BBC: Outlook. See M 1405.
0106 Christian Science Monitor: Monitor Radio Worldwide. See M 0106.
0110 Voice of America (Americas, Caribbean): Report to the Americas. News, correspondent reports, interviews, and opinion.
0110 Voice of America (South Asia): Newsline. See S 2310.
0130 BBC: Folk In Britain. Ian Anderson is the host, folk music is the fare.
0130 Voice of America (South Asia): VOA Morning. See S 0010.
0134 Christian Science Monitor: Letterbox. See M 0134.
0145 BBC: Health Matters. New medical developments and methods of keeping fit.
0148 Christian Science Monitor: Religious Article. See M 0148.
0155 Voice of America (Americas, Caribbean): Editorial.

Wednesdays

0105 BBC: Outlook. See M 1405.
0106 Christian Science Monitor: Monitor Radio Worldwide. See M 0106.
0110 Voice of America (Americas, Caribbean): Report to the Americas. See T 0110.
0110 Voice of America (South Asia): Newsline. See S 2310.
0130 BBC: Talks. This month, "After The War Was Over" looks at the aftermath of the Gulf War (6th/13th/20th); "That's The Way It Was" profiles not Walter Cronkhite, but pop groups that have fallen out of favor (through January 1st).
0130 Voice of America (South Asia): VOA Morning. See S 0010.
0134 Christian Science Monitor: Letterbox. See M 0134.
0145 BBC: Country Style. David Allan profiles the country music scene on both sides of the pond.
0148 Christian Science Monitor: Religious Article. See M 0148.
0155 Voice of America (Americas, Caribbean): Editorial. See S 1455.

Thursdays

0105 BBC: Outlook. See M 1405.
0106 Christian Science Monitor: Monitor Radio Worldwide. See M 0106.
0110 Voice of America (Americas, Caribbean): Report to the Americas. See T 0110.
0110 Voice of America (South Asia): Newsline. See S 2310.
0130 BBC: Waveguide. See M 0530.
0130 Voice of America (South Asia): VOA Morning. See S 0010.
0134 Christian Science Monitor: Letterbox. See M 0134.
0140 BBC: Book Choice. A short review of a recently released book.
0145 BBC: The Farming World. Agricultural news and technological innovations for farmers.
0148 Christian Science Monitor: Religious Article. See M 0148.
0155 Voice of America (Americas, Caribbean): Editorial. See S 1455.

Fridays

0105 BBC: Outlook. See M 1405.
0106 Christian Science Monitor: Monitor Radio Worldwide. See M 0106.
0110 Voice of America (Americas, Caribbean): Report to the Americas. See T 0110.
0110 Voice of America (South Asia): Newsline. See S 2310.
0130 BBC: Seven Seas. Malcolm Billings presents news about ships and the sea.
0130 Voice of America (South Asia): VOA Morning. See S 0010.
0134 Christian Science Monitor: Letterbox. See M 0134.
0145 BBC: Global Concerns. An update on environmental issues.
0148 Christian Science Monitor: Religious Article. See M 0148.
0155 Voice of America (Americas, Caribbean): Editorial. See S 1455.

Saturdays

0105 BBC: Outlook. See M 1405.
0105 Christian Science Monitor: Herald of Christian Science. See S 0005.
0110 Voice of America (Americas, Caribbean): Report to the Americas. See T 0110.
0110 Voice of America (South Asia): VOA Morning. See S 0010.
0130 BBC: Short Story. Drama written by BBC listeners; this month, selections by African listeners (except 2nd, 30th: Seeing Stars, a monthly series on astronomy).
0145 BBC: Jazz Now And Then. George Reid presents a weekly mix of new releases, old tracks, and interviews.
0155 Voice of America (Americas, Caribbean): Editorial. See S 1455.

English language

shortwave guide

0200 UTC [9:00 PM EST/6:00 PM PST]

FREQUENCIES

0200-0300	ABC Brisbane	4920do	9660do		
0200-0300	ABC Perth	200	6070do	9610do	
0200-0230	BBC London	5975na	6005sa	6175na	6195eu
		7135as	7325na	9410eu	9580as
		9590na	9670me	9915na	11750sa
		11955as	12095va	15260sa	15280as
		15360pa	15380as	21715as	
0200-0300	CKZU Vancouver	6160do			
0200-0300	CSM World Svc, Boston	9350eu	9455eu	13760eu	17555eu
		17865va			
0200-0250	Deutsche Welle	7285as	9615as	9690as	11945as
		11965as	15235as		
0200-0230	FEBC Manila	15480as			
0200-0300	HCJB Quito	9745na	15155na	17875sa	
0200-0300 AS	KSDA Guam	13720as			
0200-0300	KTBN Salt Lake City	7510am			
0200-0300	R. for Peace Int'l	7375na	13630na	15030na	21465na
0200-0300	Radio Australia	11880va	11930va	15160va	15240va
		15320va	17630va	17715va	17750va
		17795va	21525va	21740va	21775va
0200-0300	Radio Cairo	9475na	9675na		
0200-0300 twhfa	Radio Canada Int'l	9535ca	9755ca	11845ca	11940ca
		13720ca			
0200-0300	Radio Cultura,Guatemala	3300do			
0200-0300	Radio Havana Cuba	11950am	15140na		
0200-0300	Radio Luxembourg	15350om			
0200-0300	Radio Moscow NAS	4895na	11690va	11710na	11780va
		11835va	11850na	11980va	12005va
		12050va	13605va	15140va	15290va
		15315va	15320va	15410va	15415va
		15425va	15480va	15540va	15550va
0200-0300	Radio Moscow NAS	9530na	9600na	9685na	9720na
		11730na	11750na	15580va	15590va
		15595va	16190va	17600va	17620va
		17730va	17850va	17860va	17890va
		21635va	21690va	21790va	21845va
0200-0300	Radio New Zealand Int'l	17770pa			
0200-0230 sm	Radio Norway	9605na			
0200-0300	Radio Romania Int'l	5990am	6155am	9570am	11830am
		11940am	15380am		
0200-0230	Radio Sweden	9695na	11705na		
0200-0300	Radio Thailand	4830as	9655as	11905as	
0200-0300 TWHFA	RAE Buenos Aires	11710na			
0200-0300 smtwh	RTM Malaysia	7295do			
0200-0300	SBC Radio 1, Singapore	5052do	11940do		
0200-0300	SLBS, Sierra Leone	3316do			
0200-0230	Sri Lanka B'casting Corp.	6005as	9720as	15425as	
0200-0230	Swiss Radio Int'l	6125am	6135am	9650am	9885am
		12035am	17730am		
0200-0300	V. of Free China, Taiwan	5950na	9680na	9765pa	11740ca
		11860as	15345as		
0200-0230 mtwhf	Voice of America	5995ca	9775ca	9815ca	11580ca
		15205ca			
0200-0300	Voice of America	7115as	7205as	11705as	15115as
		15160as	15250as	17740as	21550as
0200-0230 mtwhfa	Voice of Kenya	4935do			
0200-0300	WHRI Noblesville	7435na	9495sa		
0200-0300	WINB Red Lion, Penn.	15145eu			
0200-0300	WRNO New Orleans	7355am			
0200-0300	WWCR Nashville	7520na			
0200-0300	WYFR Okeechobee	6065na	9505am	15440na	
0230-0300	BBC London	5975na	6005sa	6175na	6195eu
		7135me	7325na	9410eu	9670me
		9915na	11750sa	11955me	12095va
		15260sa	15280as	15360pa	21715as
0230-0300	Radio Federal Yugoslavia		9555am		
0230-0250	Radio Finland	15185na	15430na		
0230-0300	Radio Kiev, Ukraine	9785eu			
0230-0245	Radio Pakistan	9515as	15115as	17640as	17725as
		21730as			
0230-0300	Radio Pilipinas, Manila	17760pa	17840pa	21580pa	
0230-0300	Radio Tirana	9580na	11825na		
0230-0300	Sri Lanka B'casting Corp.	9720as	15425as		
0230-0300 s	Voice of Kenya	4935do			
0240-0300	Radio 2, Zambia	6165do	7235do		
0245-0300	Radio Korea	15575va			
0249-0300	Radio Yerevan, Armenia	11675na	11790na	15180na	15455na
		15485na			
0250-0300	Vatican Radio	7305na	9615na	11625na	

SELECTED PROGRAMS

Sundays

0205 Christian Science Monitor: Herald of Christian Science. See S 0005.
0210 Voice of America: VOA Morning. See S 0010.
0230 BBC: Feature. This month, "A Sight Worth Seeing," a radio tour of Britain's famous landmarks (through 24th).

Mondays

0205 Christian Science Monitor (Americas, Oceania): The Sunday Service. See S 1605.
0206 Christian Science Monitor (Africa, Middle East): News Features. See M 0006.
0210 Voice of America: Newsline. See S 2310.
0230 BBC: Composer Of The Month. Profiles of famous composers; this month, Jean-Philippe Rameau (are they running out of famous composers?).
0230 Voice of America: VOA Morning. See S 0010.

Tuesdays

0206 Christian Science Monitor: News Features. See M 0006.
0210 Voice of America (Americas, Caribbean): Focus. See M 1110.
0210 Voice of America (South Asia): Newsline. See S 2310.
0230 BBC: Quiz. See M 1215.
0230 Voice of America (South Asia): VOA Morning. See S 0010.

Wednesdays

0206 Christian Science Monitor: News Features. See M 0006.
0210 Voice of America (Americas, Caribbean): Focus. See M 1110.
0210 Voice of America (South Asia): Newsline. See S 2310.
0230 BBC: Development '91. Aid and development issues for developing nations.
0230 Voice of America (South Asia): VOA Morning. See S 0010.

Radio Australia broadcaster

Thursdays

0206 Christian Science Monitor: News Features. See M 0006.
0210 Voice of America (Americas, Caribbean): Focus. See M 1110.
0210 Voice of America (South Asia): Newsline. See S 2310.
0230 BBC: Sports International. Live play-by-play, interviews, features, and discussions from the sports world.
0230 Voice of America (South Asia): VOA Morning. See S 0010.

Fridays

0206 Christian Science Monitor: News Features. See M 0006.
0210 Voice of America (Americas, Caribbean): Focus. See M 1110.
0210 Voice of America (South Asia): Newsline. See S 2310.
0230 BBC: Drama. See H 1130.
0230 Voice of America (South Asia): VOA Morning. See S 0010.

Saturdays

0205 Christian Science Monitor: Herald of Christian Science. See S 0005.
0210 Voice of America (Americas, Caribbean): Focus. See M 1110.
0210 Voice of America (South Asia): VOA Morning. See S 0010.
0230 BBC: People And Politics. The background to the British political scene.

0300 UTC [10:00 PM EST/7:00 PM PST]

FREQUENCIES

0300-0400	ABC Brisbane	4920do	9660do		
0300-0400	ABC Perth	9610do			
0300-0330	BBC London	3255af	5975na	6005af	6180eu
		6190af	6195eu	7135me	9410eu
		9600af	9670me	11760me	11955me
		12095eu	15280as	15310as	15360pa
		15380as	15420af	15590af	21715as
0300-0330	BBC London	9915na	6175na	7325na	15260sa
		11750sa	6005sa		
0300-0400	BBS Bahrain	6010me			
0300-0400	CFCX Montreal	6005do			
0300-0400	CFRX Toronto	6070do			
0300-0400	CKZU Vancouver	6160do			
0300-0400	CSM World Svc, Boston	9350na	9455na	13760na	17555na
		17865va			
0300-0350	Deutsche Welle	6085na	6145na	9545na	11810na
		11890na	13610na	13770na	15205na
		15425na			
0300-0400	HCJB Quito	9745na	15155na	21545na	
0300-0400	KTBN Salt Lake City	7510am			
0300-0400	KVOH Los Angeles	9785na			
0300-0400	R. for Peace Int'l	7375na	13630na	15030na	21465na
0300-0330	Radio Australia	11880va	11930va	15160va	15240va
		15320va	17630va	17715va	17750va
		17795va	21525va	21740va	21775va
0300-0400	Radio Beijing	9690am	11715am	11715am	15100am
		15110am	17705am		
0300-0400	Radio Budapest	6110na	9835na	11910na	
0300-0330	Radio Cairo	9475na	9675na		
0300-0400	Radio Cultura, Guatemala		3300do		
0300-0315	Radio Federai Yugoslavia		9555na		
0300-0400	Radio Havana Cuba	11950am	15140am		
0300-0400	Radio Japan	15195na	17810na		
0300-0330	Radio Japan, Tokyo	15325am	17825am	21610am	
0300-0400	Radio Moscow NAS	4895na	9530am	9600am	9685am
		9720va	11675va	11730am	11780va
		11800va	11850va	11980va	12035va
		12050va	13605va	15140va	15280va
		15315va	15320va	15410va	15415va
		15425va	15450va	15480va	15540va
		15550va	15580va	15590va	15595va
		16190va	17560va	17600va	17620va
		17710va	17730va	17850va	17860va
		17890va	21635va	21690va	21790va
0300-0400	Radio New Zealand Int'l	17770pa			
0300-0330 sm	Radio Norway	9645na			
0300-0330	Radio Pilipinas, Manila	17760pa	17840pa	21580pa	
0300-0330	Radio Prague	5930na	7345na	11685na	
0300-0400	Radio Tanzania	5985af	9685af	11765af	
0300-0400	Radio Thailand	4830as	9655as	11905as	
0300-0400 smtwh	RTM Malaysia	7295do			
0300-0400	SBC Radio 1, Singapore	5052do	11940do		
0300-0400	SLBS, Sierra Leone	3316do			
0300-0400	Sri Lanka B'casting Corp.	9720as	15425as		
0300-0400	TIFC Costa Rica	5055ca			
0300-0400	Trans World Radio Boniare		9535am	11930am	
0300-0400	V. of Free China, Taiwan	5950na	9680na		
0300-0315	Vatican Radio	7305na	9615na	11625na	
0300-0330	Voice of America	6095va	15160va	15195va	17810va
		17865va			
0300-0400	Voice of America	6035af	7405af	9575af	11835af
		15115af	17715af	21600af	
0300-0400	Voice of Kenya	4935do			
0300-0400	WHRI Noblesville	7435na	9495sa		
0300-0400	WRNO New Orleans	7355am			
0300-0400	WWCR Nashville	7520na			
0300-0400	WYFR Okeechobee	6065na	9505na		
0310-0325	Vatican Radio	9635na			
0330-0400	BBC London	3255af	5975na	6005af	6180eu
		6190af	6195eu	9410eu	9600af
		9915na	11740af	11760me	11955me
		12095eu	15280as	15310as	15420af
		17885af	21715as		
0330-0400	Radio Australia	11880va	11930va	15160va	15240va
		15320va	15530va	17630va	17715va
		17795va	21525va	21740va	21775va
0330-0400	Radio Netherlands	9590na	11720na		
0330-0400 twhfa	Radio Portugal	9600sa	9705na	9765na	11765sa
0330-0400	Radio Tirana	9580na	11825na		
0330-0400	RAI Vienna	9870ca	9875na	13730na	
0330-0400	UAE Radio, Dubai	11945na	13675na	15400na	15435na
0340-0350 twhfas	R National de Venezuela	9540om			
0340-0350 mtwhfa	Voice of Greece	9395am	9420am	11645am	
0350-0400	RAI, Rome	11905as	15330as	17795as	

SELECTED PROGRAMS

Sundays

0305 Christian Science Monitor: Herald of Christian Science. See S 0005.
0310 Voice of America: VOA Morning. See S 0010.
0315 BBC: Sports Roundup. News from the world of sports.
0330 BBC: From Our Own Correspondent. Reporters comment on the background to the news.
0350 BBC: Write On... Listener letters, opinions, and questions.

Mondays

0306 Christian Science Monitor (Africa, Middle East): Monitor Radio Worldwide. See M 0106.
0310 Voice of America: Daybreak Africa. Correspondent reports, news features, and background reports.
0315 BBC: Sports Roundup. See S 0315.
0330 BBC: Anything Goes. See S 1430.
0334 Christian Science Monitor (Africa, Middle East): Letterbox. See M 0134.
0348 Christian Science Monitor (Africa, Middle East): Religious Article. See M 0148.

Tuesdays

0306 Christian Science Monitor: Monitor Radio Worldwide. See M 0106.
0310 Voice of America: Daybreak Africa. See M 0310.
0315 BBC: Sports Roundup. See S 0315.
0330 BBC: John Peel. Newly released albums and singles from the contemporary music scene.
0334 Christian Science Monitor: Letterbox. See M 0134.
0348 Christian Science Monitor: Religious Article. See M 0148.

Wednesdays

0306 Christian Science Monitor: Monitor Radio Worldwide. See M 0106.
0310 Voice of America: Daybreak Africa. See M 0310.
0315 BBC: Sports Roundup. See S 0315.
0330 BBC: Discovery. An in-depth look at scientific research.
0334 Christian Science Monitor: Letterbox. See M 0134.
0348 Christian Science Monitor: Religious Article. See M 0148.

Thursdays

0306 Christian Science Monitor: Monitor Radio Worldwide. See M 0106.
0310 Voice of America: Daybreak Africa. See M 0310.
0315 BBC: Sports Roundup. See 0315.
0330 BBC: Assignment. A weekly examination of topical issues, from Batman to the Amazon.
0334 Christian Science Monitor: Letterbox. See M 0134.
0348 Christian Science Monitor: Religious Article. See M 0148.

Fridays

0306 Christian Science Monitor: Monitor Radio Worldwide. See M 0106.
0310 Voice of America: Daybreak Africa. See M 0310.
0315 BBC: Sports Roundup. See S 0315.
0330 BBC: Focus On Faith. Comment and discussion on major issues in various religions.
0334 Christian Science Monitor: Letterbox. See M 0134.
0348 Christian Science Monitor: Religious Article. See M 0148.

Saturdays

0305 Christian Science Monitor: Herald of Christian Science. See S 0005.
0310 Voice of America: VOA Morning. See S 0010.
0315 BBC: Sports Roundup. See S 0315.
0330 BBC: The Vintage Chart Show. Paul Burnett with past Top 20 pop music hits.

English language

shortwave guide

0400 UTC [11:00 PM EST/8:00 PM PST]

FREQUENCIES

0400-0500	ABC Brisbane	4920do	9660do		
0400-0500	ABC Perth	9610do			
0400-0430	BBC London	3255af	3955eu	5975na	6180eu
		6190af	6195eu	7105af	7230eu
		9410eu	9600af	9610af	9915na
		11760me	15070va	15280as	15310as
		15420af	15590eu	17885af	21715as
0400-0430	BBC London	6005af	6175am	11750va	11955me
		12095va			
0400-0500	BBS Bahrain	6010me			
0400-0500	CFCX Montreal	6005do			
0400-0500	CFRX Toronto	6070do			
0400-0500	CKZU Vancouver	6160do			
0400-0415	Croatian Radio, Zagreb	7315am			
0400-0500	CSM World Svc, Boston	9455na	9840af	13760na	17555as
		17780as			
0400-0450	Deutsche Welle	6145af	7150af	7225af	9565af
		9765af	11765af	11890af	13610af
		13770af	15425af		
0400-0500	HCJB Quito	9745na	15155na		
0400-0500	KTBN Salt Lake City	7510am			
0400-0500	KVOH Los Angeles	9785am			
0400-0500	R. for Peace Int'l	7375na	13630na	15030na	21465na
0400-0500	Radio 2, Zambia	6165do	7235do		
0400-0500	Radio Australia	11880va	11930va	15160va	15240va
		15320va	15365pa	15530va	17630va
		17715va	17795va	21525va	21740va
		21775va			
0400-0500	Radio Beijing	11685am	11840am		
0400-0430	Radio Canada Int'l	15275me			
0400-0500	Radio Canada Int'l	11925as			
0400-0425	Radio Cultura, Guatemala		3300do		
0400-0500	Radio Cultura, Guatemala		3300do		
0400-0450	Radio Havana Cuba	5965am	9505am	9750am	11760am
		11820am	11950am		
0400-0500	Radio Moscow	9530na	9600na	9685na	11675va
		11780va	11850va	11980va	11995va
		12055va	13775va	15140va	15210va
		15280va	15315va	15415va	15450va
		15480va	15525va	15535va	15540va
		15550va	15590va	17560va	17600va
		17620va	17635va	17640VA	17710VA
		17730VA	17850VA	17860VA	17890VA
		21475VA	21565va	21625va	21630va
		21690va	21725na	21790va	21845na
0400-0500	Radio Moscow NAS West Cst		9635na	12050na	13605na
		13645na			
		15180na	15410na	15425na	15455na
		15580na	15595na	16190na	
0400-0425	Radio Netherlands	9590am	11720am		
0400-0500 smtwhf	Radio New Zealand Int'l	17770pa			
0400-0430	Radio Prague	5930na	7345na	11685na	
0400-0500	Radio Pyongyang	15180as	15230as	17765as	
0400-0430	Radio Romania Int'l	5990am	6155am	9510am	9570am
		11830am	11940am		
0400-0500	Radio RSA, Johannesburg		7270af	11900af	15440af
0400-0500	Radio Sofia, Bulgaria	11720eu	15160af	17825af	
0400-0430	Radio Tanzania	5985af	9685af	11765af	
0400-0430	Radio Thailand	4830as	9655as	11905as	
0400-0410	RAI, Rome	11905as	15330as	17795as	
0400-0425	RAI, Rome	5990me	7275me		
0400-0500 smtwh	RTM Malaysia	7295do			
0400-0500	SBC Radio 1, Singapore	5052do	11940do		
0400-0500	SLBS, Sierra Leone	3316do			
0400-0430	Sri Lanka B'casting Corp.	9720as	15425as		
0400-0430	Swiss Radio Int'l	6135am	9885am	12035am	13635me
0400-0430	Trans World Radio Bonaire		9535am	11930am	
0400-0430	Voice of America	5995eu	6040eu	6140eu	7170eu
		7200eu	11825eu	15115eu	15205eu
0400-0430	Voice of America	6035af	9575af	11835af	15350af
		17715af	21600af		
0400-0500	Voice of America	5995va	6140va	7170va	7200va
		7405va	9715va		
0400-0500	Voice of Kenya	4935do			
0400-0500	Voice of Turkey	9445na	17880as		
0400-0500	WHRI Noblesville	7435na	9495sa		
0400-0500 smtwhf	WMLK Bethel	9465eu			
0400-0500	WRNO New Orleans	7355am			
0400-0500	WWCR Nashville	7520na			
0400-0500	WYFR Okeechobee	6065na	9505na		
0430-0500	BBC London	3255af	3955eu	5975na	6005af
		6180eu	6190af	6195eu	7230eu
		9410eu	9600af	11760me	12095va
		15070va	15280as	15310as	15400af
		15420af	15590eu	21470af	21715as
0430-0500	Georgian Radio, Tbilisi	11850me			
0430-0500 mtwhf	NBC Windhoek, Namibia	3270af	3290af		
0430-0500	Radio Nigeria	3326do	4990do		
0430-0500 s	Radio Zambia Int'l	9505af	11880af	17895af	
0430-0500	TWR Swaziland	5055af	5965af	9655af	11750af
0430-0500	Voice of America	3980eu	5995eu	6040eu	6140eu
		7170eu	7200eu	11825eu	15205eu
0430-0500	Voice of America	6035af	9575af	15115af	17715af
		21600af			
0432-0500	FEBA Seychelles	17810me			
0450-0500	Radio Havana Cuba	9750am	11760am	11820am	

SELECTED PROGRAMS

Sundays

0405 Christian Science Monitor: Herald of Christian Science. See S 0005.
0410 Voice of America: VOA Morning. See S 0010.
0430 BBC: Pop Music. "The Best of British" includes the likes of Sting, 10cc, Ian Dury, and Squeeze (through January 5th).
0445 BBC: Talks. Try your hand with Colin Ford at "Mastering Photography" (3rd/10th) before traveling "Behind The Stage Door" (through December 29th).

Mondays

0405 Christian Science Monitor (Americas, Europe): The Sunday Service. See S 1605.
0406 Christian Science Monitor (Africa, Asia, Middle East): News Features. See M 0006.
0410 Voice of America: Newsline. See S 2310.
0430 BBC: Off The Shelf. This month's serialized readings include "The Life of Frederick Douglass" (4th-8th), Sherlock Holmes in "The Sign Of Four" (11th-22nd) and Conrad's "Lord Jim" (through December 13th).
0430 Voice of America: VOA Morning. See S 0010.
0445 BBC: Andy Kershaw's World Of Music. Exotic music from the world over.

Tuesdays

0406 Christian Science Monitor: News Features. See M 0006.
0410 Voice of America: Newsline. See S 2310.
0430 BBC: Off The Shelf. See M 0430.
0430 Voice of America: VOA Morning. See S 0010.
0445 BBC: Europe's World. Life in Europe and its links with the rest of the world.

Wednesdays

0406 Christian Science Monitor: News Features. See M 0006.
0410 Voice of America: Newsline. See S 2310.
0430 BBC: Off The Shelf. See M 0430.
0430 Voice of America: VOA Morning. See S 0010.
0445 BBC: Country Style. See W 0145.

Thursdays

0406 Christian Science Monitor: News Features. See M 0006.
0410 Voice of America: Newsline. See S 2310.
0430 BBC: Off The Shelf. See M 0430.
0430 Voice of America: VOA Morning. See S 0010.
0445 BBC: From Our Own Correspondent. See S 0330.

Fridays

0406 Christian Science Monitor: News Features. See M 0006.
0410 Voice of America: Newsline. See S 2310.
0430 BBC: Off The Shelf. See M 0430.
0430 Voice of America: VOA Morning. See S 0010.
0445 BBC: Folk In Britain. See T 0130.

Saturdays

0405 Christian Science Monitor: Herald of Christian Science. See S 0005.
0410 Voice of America: VOA Morning. See S 0010.
0430 BBC: Jazz Now And Then. See A 0145.
0445 BBC: Worldbrief. See F 2315.

English language **shortwave guide**

0500 UTC [12:00 AM EST/9:00 PM PST]

FREQUENCIES

0500-0600	ABC Brisbane	4920do 9660do
0500-0600	ABC Perth	9610do
0500-0530	BBC London	3255af 3955eu 6005af 6180as 6190af 6195eu 7230eu 9410eu 9600af 9640na 11760me 12095va 15070as 15310as 15400af15420af 15590va 17885af 21470af21715as
0500-0530	BBC London	5975na 15280as
0500-0600	BBS Bahrain	6010me
0500-0600	CFCX Montreal	6005do
0500-0600	CFRX Toronto	6070do
0500-0600	CKZU Vancouver	6160do
0500-0530	CRTV Buea	3970do
0500-0600	CSM World Svc, Boston	9455eu 9840eu 13760eu 17555eu 17780va
0500-0550	Deutsche Welle	5960na 6120na 9700na 9670na 11705na 11890na 13610na 13790na
0500-0600	HCJB Quito	9745na 15155na
0500-0600	KTBN Salt Lake City	7510am
0500-0600	KVOH Los Angeles	9785am
0500-0510 w	Malawi B'casting Corp.	3381do
0500-0600 mtwhf	NBC Windhoek, Namibia	3270af 3290af
0500-0600 sa	R. E. Africa, Eq Guinea	9585af
0500-0600	R. for Peace Int'l	7375na 13630na 15030na 21465na
0500-0600	Radio 2, Zambia	6165do 7235do
0500-0600	Radio Australia	11880va 11930va 15160va 15240va 15320va 15365pa 15530va 17630va 17715va 17795va 21525va 21740va 21775va
0500-0600	Radio Havana Cuba	9750am 11760am 11820am
0500-0600	Radio Japan	15195na 17765na 17810na 17825na 17890na 21610na
0500-0510	Radio Lesotho	4800do
0500-0600	Radio Moscow	9530na 9685na 11675va 11980va 11995va 13775va 15140va 15210va 15280va 15315va 15320va 15415va 15450va 15525va 15535va 15540va 15545va 15550va 15590va 17560va 17600va 17620va 17625va 17635va 17640va 17710va 17730va 17850va 17860va 17890va 21475va 21625va 21630va 21635va 21645va 21690va 21725va 21740va 21790va 21845va
0500-0600	Radio Moscow NAS West Cst	9635na 12050na 13605na 13645na 15180na 15410na 15425na 15455na 15595na 16190na
0500-0600	Radio New Zealand Int'l	17770pa
0500-0600	Radio Nigeria	3326do 4990do
0500-0600	Radio Sofia, Bulgaria	11720eu 15160af 17825af
0500-0600	Radio Thailand	4830as 9655as 11905as
0500-0600 s	Radio Zambia Int'l	9505af 11880af 17895af
0500-0600	RTM Malaysia	7295do
0500-0600	SBC Radio 1, Singapore	5052do 11940do
0500-0600	SLBS, Sierra Leone	3316do
0500-0600	Spanish Foreign Radio	9630na
0500-0530	TWR Swaziland	5965af 9655af 11750af
0500-0530	Vatican Radio	6185eu 6248eu 17710af 17730af 21650af
0500-0530	Voice of America	3980eu 5995eu 6040eu 6140eu 7170eu 7200eu 11825eu 15205eu
0500-0600	Voice of America	5995va 6060va 6140va 7170va 7200va 9670va 9700va 9715va 11825va 15205va
0500-0600	Voice of America	6035af 7405af 9575af 15115af 17715af
0500-0600	Voice of Kenya	4935do
0500-0600	Voice of Nigeria	7255af
0500-0600	WHRI Noblesville	7435na 9495sa
0500-0600	WINB Red Lion, Penn.	15145eu
0500-0600	WRNO New Orleans	7355am
0500-0600	WWCR Nashville	7520na
0500-0600	WYFR Okeechobee	5985na 11580am 15566eu
0510-0515 w	Radio Botswana	5955af 7255af
0515-0600 mtwhf	Radio Canada Int'l	6050eu 6150eu 7295eu 9750eu 11775eu 17840eu
0524-0600 f	Radio 2, Accra, Ghana	3366do
0526-0600	Radio 1, Accra, Ghana	4915do
0530-0600	BBC London	3255af 3955eu 5975na 6005af 6180as 6190af 6195eu 7230eu 9410eu 9600af 9640na 11760me 12095va 15070as 15310as 15400af 15420af 15590va 17885af21470af
0530-0600	BBC London	15280as 21715as
0530-0600	Cameroon Radio-TV	4850do
0530-0600	Guizhou PBS Guiyang China	3260do 7275do
0530-0600	Radio Romania Int'l	15340af 15380af 17720af 17745af 17790af 21665af
0530-0600	RAI Vienna	6015na 6155eu 13730eu 15410me 21490me
0530-0600	TWR Swaziland	5965af 11750af
0530-0600	UAE Radio, Dubai	15435as 17830as 21700as
0530-0600	Voice of America	3980eu 5995eu 6040eu 6060eu 6140eu 7170eu 7200eu 11825eu 15205eu
0545-0600	Radio Buea, Cameroon	3970do

SELECTED PROGRAMS

Sundays

0505 Christian Science Monitor: Herald of Christian Science. See S 0005.
0509 BBC: Twenty-Four Hours. Analysis of the main news of the day.
0510 Voice of America: VOA Morning. See S 0010.
0530 BBC: World Business Review. News and upcoming events.
0540 BBC: Words Of Faith. Various faiths discuss beliefs.
0545 BBC: Letter From America with Alistair Cooke.

Mondays

0506 Christian Science Monitor (Africa, Asia, Middle East): Monitor Radio Worldwide. See M 0106.
0509 BBC: Twenty-Four Hours. See S 0509.
0510 Voice of America: Newsline. See S 2310.
0530 BBC: Waveguide. Tips on how to hear the BBC better.
0530 Voice of America: VOA Morning. See S 0010.
0534 Christian Science Monitor (Africa, Asia, Middle East): Letterbox. See M 0134.
0540 BBC: Words Of Faith. See S 0540.
0545 BBC: Recording Of The Week. Choice of classical music.
0548 Christian Science Monitor (Africa, Asia, Middle East): Religious Article. See M 0148.

Tuesdays

0506 Christian Science Monitor: Monitor Radio Worldwide. See M 0106.
0509 BBC: Twenty-Four Hours. See S 0509.
0510 Voice of America: Newsline. See S 2310.
0530 BBC: World Business Report. See M 2305.
0530 Voice of America: VOA Morning. See S 0010.
0534 Christian Science Monitor: Letterbox. See M 0134.
0540 BBC: Words Of Faith. See S 0540.
0545 BBC: The World Today. See M 1645.
0548 Christian Science Monitor: Religious Article. See M 0148.

Wednesdays

0506 Christian Science Monitor: Monitor Radio Worldwide. See M 0106.
0509 BBC: Twenty-Four Hours. See S 0509.
0510 Voice of America: Newsline. See S 2310.
0530 BBC: World Business Report. See M 2305.
0530 Voice of America: VOA Morning. See S 0010.
0534 Christian Science Monitor: Letterbox. See M 0134.
0540 BBC: Words Of Faith. See S 0540.
0545 BBC: The World Today. See M 1645.
0548 Christian Science Monitor: Religious Article. See M 0148.

Thursdays

0506 Christian Science Monitor: Monitor Radio Worldwide. See M 0106.
0509 BBC: Twenty-Four Hours. See S 0509.
0510 Voice of America: Newsline. See S 2310.
0530 BBC: World Business Report. See M 2305.
0530 Voice of America: VOA Morning. See S 0010.
0534 Christian Science Monitor: Letterbox. See M 0134.
0540 BBC: Words Of Faith. See S 0540.
0545 BBC: The World Today. See M 1645.
0548 Christian Science Monitor: Religious Article. See M 0148.

Fridays

0506 Christian Science Monitor: Monitor Radio Worldwide. See M 0106.
0509 BBC: Twenty-Four Hours. See S 0509.
0510 Voice of America: Newsline. See S 2310.
0530 BBC: World Business Report. See M 2305.
0530 Voice of America: VOA Morning. See S 0010.
0534 Christian Science Monitor: Letterbox. See M 0134.
0540 BBC: Words Of Faith. See S 0540.
0545 BBC: The World Today. See M 1645.
0548 Christian Science Monitor: Religious Article. See M 0148.

Saturdays

0505 Christian Science Monitor: Herald of Christian Science. See S 0005.
0509 BBC: Twenty-Four Hours. See S 0509.
0510 Voice of America: VOA Morning. See S 0010.
0530 BBC: World Business Report. See M 2305.
0540 BBC: Words Of Faith. See S 0540.
0545 BBC: The World Today. See M 1645.

0600 UTC [1:00 AM EST/10:00 PM PST]

FREQUENCIES

0600-0630	BBC London	3955eu 6180eu 6190af 6195eu 7230eu 9410eu 9600af 11760me 11940af 11955as 12095eu 15070va 15310as 15400af 15420af 15590va 17790as 17830as 17885af 21470af
0600-0630	BBC London	5975na 7150pa 9640va 15280as 15360pa 21715as
0600-0700	BBS Bahrain	6010me
0600-0625	Cameroon Radio-TV	4850do
0600-0700	CFCX Montreal	6005do
0600-0700	CFRX Toronto	6070do
0600-0700	CKZU Vancouver	6160do
0600-0700	CSM World Svc, Boston	9455eu 9840eu 9870na 17555eu 17780va
0600-0650	Deutsche Welle	11765af 13610af 13790af 15185af 15205af 17875af
0600-0700 tent	ELBC Monrovia, Liberia	7275do
0600-0700	HCJB Quito	9745na 15115na
0600-0700	King of Hope, Lebanon	6280me
0600-0700	KTBN Salt Lake City	7510na
0600-0700	KVOH Los Angeles	9785na
0600-0610 s	Malawi B'casting Corp.	3381do
0600-0630	Nat'l Radio of Laos	7112as
0600-0700 sa	R. E. Africa, Eq. Guinea	9585af
0600-0700	R. for Peace Int'l	7 375na 13630na 15030na 21566na
0600-0700	Radio 1, Accra, Ghana	4915do
0600-0700 f	Radio 2, Accra, Ghana	3366do
0600-0700	Radio 2, Zambia	6165do 7235do
0600-0700	Radio Australia	11880va 11930va 15160va 15240va 15320va 15365va 17630va 17750va 17795va 21525va 21740va 21775va
0600-0645 s	Radio Douala, Cameroon	4795do
0600-0700	Radio Georgia, Tbilisi	12070eu
0600-0700	Radio Havana Cuba	11760am
0600-0700	Radio Korea	7275om 11810na 15170na
0600-0630 s	Radio Latvia, Riga	5935eu
0600-0700	Radio Moscow	11675na 11775va 11980va 13775va 15140va 15210va 15280va 15415va 15425na 15535va 15545va 15550va 15590va 17560va 17600va 17620va 17625va 17635va 17640VA 17710va 17730va 17850va 17860va 21630va 21645va 21690va 21725va 21740va 21785va 21790va 21845va
0600-0700	Radio Moscow NAS West Cst	9635na 12050na 13605na 13645na 15180na 15410na 15425na 15455na 15595na 16190na 17605na
0600-0700	Radio New Zealand Int'l	17770pa
0600-0700	Radio Nigeria	3326do 4990do
0600-0700	Radio Pyongyang	15180as 15230as
0600-0615	Radio Sofia, Bulgaria	11720eu 15160af 17825af
0600-0700 sa	Radio Thailand	4830as 9655as 11905as
0600-0630 s	Radio Zambia Int'l	9505af 11880af 17895af
0600-0700 smtwha	RTM Malaysia	7295do
0600-0700	SBC Radio 1, Singapore	5052do 11940do
0600-0700	SLBS, Sierra Leone	3316do
0600-0700	TWR Swaziland	5965af 7200af 11750af
0600-0700	V. of the Mediterranean	9765eu
0600-0620	Vatican Radio	6185eu 6248eu
0600-0700	VOA Europe	3980eu 5995eu 6040eu 6060eu 6095eu 6140eu 7170eu 7325eu 11805eu
0600-0700	Voice of America	6035af 6125af 7405af 9530af 9575af 15115af 17715af
0600-0625	Voice of Kenya	4935do
0600-0700	Voice of Malaysia	6175as 9750as 15295as
0600-0700	WHRI Noblesville	7435eu 9495sa
0600-0700 smtwhf	WMLK Bethel	9465eu
0600-0700	WWCR Nashville	7520na
0600-0700	WYFR Okeechobee	5985na 7355eu 9660af 13760na 15566eu
0600-0630 s	ZLXA New Zealand	3935do
0615-0630 s	Radio Bertoua, Cameroon	4750do
0625-0700	Voice of Kenya	4935do
0630-0700	BBC London	5975na 6180eu 6190af 6195eu 7230eu 9410eu 9600af 9640pa 11760me 11940af 11955as 12095eu 15070va 15310as 15400af 15420af 15590va 17830as 17885af 21470af
0630-0700	BBC London	7150pa 15280as 15360pa 17790as 21715as
0630-0700	Radio Finland	6120eu 9560eu 11755eu
0630-0700	RAI Vienna	6015na
0630-0635 mtwhf	RTV Congolaise	7105do 9610do
0630-0700	Swiss Radio Int'l	15430af 17570af 21770af
0630-0700	Vatican Radio	11710af 17730af 21650af
0630-0700 smtwhf	ZLXA New Zealand	3935do
0645-0700	Ghana B'casting Corp.	6130af
0645-0700	Radio Romania Int'l	11940au 15335au 17720au 17805au 21665au

SELECTED PROGRAMS

Sundays

0605 Christian Science Monitor: Herald of Christian Science. See S 0005.
0610 Voice of America: VOA Morning. See S 0010.
0630 BBC: Jazz For The Asking. Digby Fairweather plays listener requests.

Mondays

0606 Christian Science Monitor: News Features. See M 0006.
0610 Voice of America (Africa): Daybreak Africa. See M 0310.
0610 Voice of America: Newsline. See S 2310.
0630 BBC: Feature. See S 1401.
0630 Voice of America: VOA Morning. See S 0010.

Tuesdays

0606 Christian Science Monitor: News Features. See M 0006.
0610 Voice of America (Africa): Daybreak Africa. See M 0310.
0610 Voice of America: Newsline. See S 2310.
0630 BBC: Rock/Pop Music. Tommy Vance brings the dressing to the always hard-rocking "Rock Salad" (through December 3rd). Rock on!
0630 Voice of America: VOA Morning. See S 0010.

Wednesdays

0606 Christian Science Monitor: News Features. See M 0006.
0610 Voice of America (Africa): Daybreak Africa. See M 0310.
0610 Voice of America: Newsline. See S 2310.
0630 BBC: Meridian. Events in the world of the arts.
0630 Voice of America: VOA Morning. See S 0010.

Thursdays

0606 Christian Science Monitor: News Features. See M 0006.
0610 Voice of America (Africa): Daybreak Africa. See M 0310.
0610 Voice of America: Newsline. See S 2310.
0630 BBC: Sports International. See H 0230.
0630 Voice of America: VOA Morning. See S 0010.

Fridays

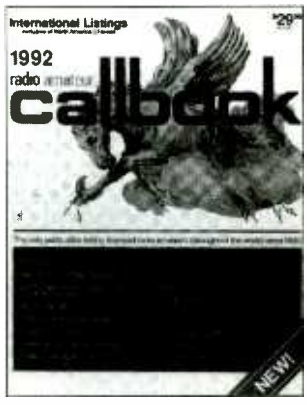
0606 Christian Science Monitor: News Features. See M 0006.
0610 Voice of America (Africa): Daybreak Africa. See M 0310.
0610 Voice of America: Newsline. See S 2310.
0630 BBC: Meridian. See W 0630.
0630 Voice of America: VOA Morning. See S 0010.

Saturdays

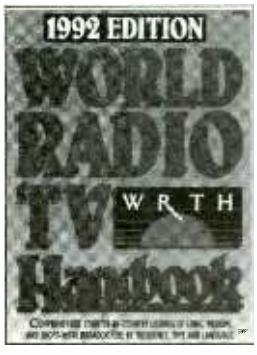
0605 Christian Science Monitor: Herald of Christian Science. See S 0005.
0610 Voice of America: VOA Morning. See S 0010.
0630 BBC: Meridian. See W 0630.

COVERING THE COMPLETE RADIO SPECTRUM...

1992 Radio Amateur Callbook: North American Edition
The North American Callbook lists the calls, names, and addresses for more than 500,000 licensed amateurs in all countries of North America from Panama through Canada, including Greenland, Bermuda, and the Caribbean islands, plus Hawaii and the U.S. possessions. 1,592 pages. 8 3/8 x 10 7/8. Item #087123. (paper) $29.95



1992 Radio Amateur Callbook: International Edition
The International Callbook lists more than 500,000 licensed amateurs in countries outside North America. Its coverage includes South America, Europe, Africa, Asia, and the Pacific area (exclusive of Hawaii and the U.S. possessions). 1,720 pages. 8 3/8 x 10 7/8. Item #087115. (paper) $29.95



World Radio TV Handbook, 1992 Edition
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The Traveler's Guide to World Radio, 1992 Edition
edited by Andrew G. Sennitt. Especially designed for the business or recreational traveler, this book offers—in a handy size and graphic format—details of English radio broadcasts accessible in major international travel destinations. 128 pages. 7 1/2 x 3 3/4. Item #077675. (paper) $9.95

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English language

shortwave guide

0700 UTC [2:00 AM EST/11:00 PM PST]

FREQUENCIES

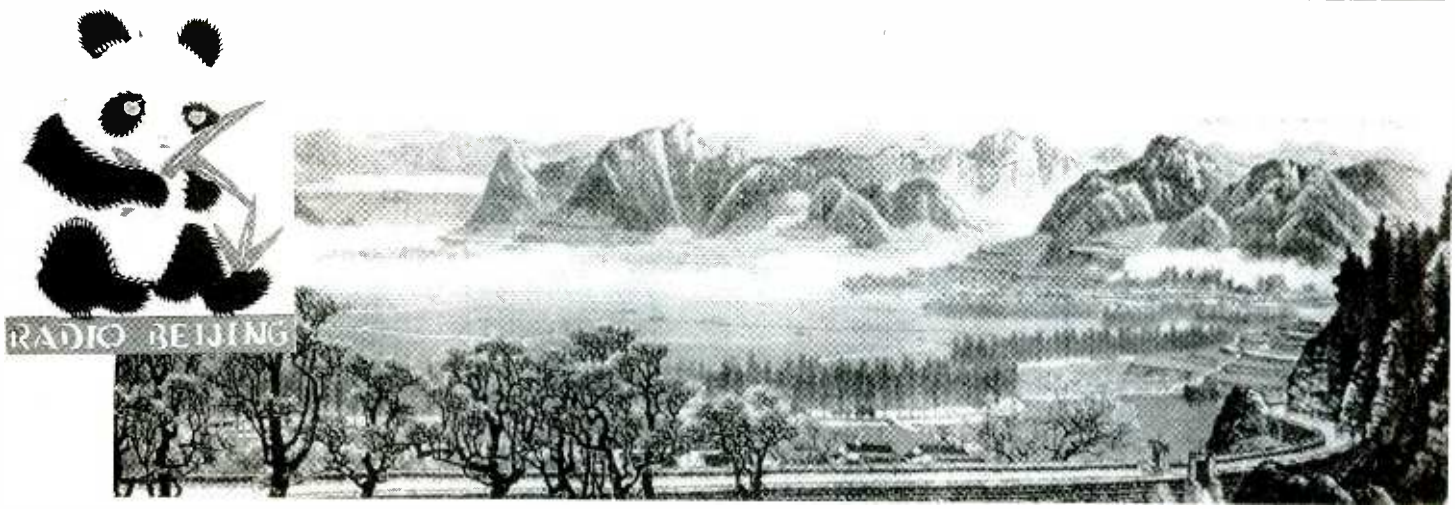
0700-0730	BBC London	1780as	5975na	7150pa	9640va
		11955as	15280as	15360pa	21715as
0700-0730	BBC London	6180eu	6190af	6195eu	7230eu
		7325af	9410eu	9760eu	11760me
		11940af	12095eu	15070eu	15310as
		15400af	15420af	15590eu	17640va
		17790as	17885af	21470af	21660af
0700-0800	BBS Bahrain	6010me			
0700-0800	CFCX Montreal	6005do			
0700-0800	CFRX Toronto	6070do			
0700-0800	CKZU	6160do			
0700-0800	CSM World Svc, Boston	9455eu	9840eu	9870pa	17555as
		17780va			
0700-0800 tent	ELBC Monrovia, Liberia	7275do			
0700-0730	Georgian Radio, Tbilisi	12050me	12070au		
0700-0800	Ghana B'casting Corp.	6130af			
0700-0800	HCJB Quito	11835eu	15270eu	17790eu	
0700-0800 mtwhf	Italian Radio Relay Svc	9815eu			
0700-0800	King of Hope, Lebanon	6280me			
0700-0800	KTBN Salt Lake City	7510na			
0700-0800	KVOH Los Angeles	9785na			
0700-0710 w	Malawi B'casting Corp.	3381do	5995do		
0700-0800 sa	R. E. Africa, Eq. Guinea	9585af			
0700-0800	R. for Peace Int'l	7375na	13630na	15030na	21465na
0700-0800	Radio 1, Accra, Ghana	4915do			
0700-0800 f	Radio 2, Accra, Ghana	3366do			
0700-0800	Radio 2, Zambia	6165do	7235do		
0700-0800	Radio Australia	11880va	11930va	15240va	15320va
		17630va	21525va	21740va	21775va
0700-0710	Radio Bafoussam, Cameroon		4000do		
0700-0800	Radio Havana Cuba	11835am			
0700-0800	Radio Japan	15250me	17765eu	17810as	17890as
		21575as			
0700-0800	Radio Moscow	17560va	17570va	17600va	
		17620va	17625va	17635va	17710va
		17730va	17765va	17835va	17850va
		17860va	17890va	21475va	21515va
		21625va	21630va	21645va	21655va
0700-0800	Radio Moscow	7315va	11730va	11775va	11980va
		11995va	12010va	13775va	15140va
		15205va	15280va	15320va	15340va
		15350va	15375va	15415va	15450va
		15535va	15540va	15545va	15550va
		21690va	21725va	21740va	21785va
		21790va	21845va		
0700-0800	Radio Moscow NAS West Cst		9635na	12050na	13605na
		13645na	15180na	15410na	15425na
		15595na	16190na	17605	
0700-0730	Radio New Zealand Int'l	17770pa			
0700-0800	Radio Nigeria	3326do	4990do		
0700-0800	Radio Pyongyang	15340as	17765as		
0700-0715	Radio Romania Int'l	11940au	15335au	17720au	17805au
		21655au			
0700-0800 sa	Radio Thailand	4830as	9655as	11905as	
0700-0800 smtwha	RTM Malaysia	7295do			
0700-0800	SBC Radio 1, Singapore	5052do	11940do		
0700-0800	SLBS, Sierra Leone	3316do			
0700-0800	TWR Monte Carlo	9480na			
0700-0800	TWR Swaziland	7200af	11750af		
0700-0800	V. of Free China, Taiwan	5950na			
0700-0710 mtwhf	Vatican Radio	6185eu	6248eu	9645eu	11740eu
0700-0800	Voice of Kenya	4935do			
0700-0800	Voice of Malaysia	6175as	9750as	15295as	
0700-0800	WHRI Noblesville	7435eu	9495sa		
0700-0800	WWCR Nashville	7520am			
0700-0800	WYFR Okeechobee	7355na	13695na	13760eu	15566eu
0700-0800 smtwhf	ZXLA New Zealand	3935do			
0705-0800 a	Radio Douala, Cameroon	4795do			
0730-0800	AWR Foli, Italy	7230eu			
0730-0800	BBC London	6180eu	6190af	7325eu	9410eu
		9600af	9760eu	11760me	11860af
		11940af	12095va	15070eu	15105af
		15400af	15420af	15590af	17640va
		17830as	17885af	21470af	21660af
0730-0800	BBC London	7150pa	9640va	11955as	15280as
		15310as	15360pa	17790as	21715as
0730-0800	BRT Brussels	6035eu	11695eu	13675eu	
0730-0745 mtwhf	Icelandic National Radio	3295om	6100om	9265om	
0730-0800	R. New Zealand Int'l	9700pa			
0730-0800	Radio Netherlands	9630au	11895au		
0730-0800	Radio New Zealand	9700as			
0730-0800	Radio Prague	17840pa	21705as		
0730-0800	Swiss Radio Int'l	3985eu	6165eu	9535eu	
0740-0800	TWR Monte Carlo	9480eu			

BBC Correspondent Andrew Whitehead

0800 UTC [3:00 AM EST/12:00 AM PST]

FREQUENCIES

0800-0830	BBC London	6180eu	6190af	7325eu	9410eu
		9600af	9760eu	11760me	11860af
		12095eu	15070eu	15310as	15360pa
		15400af	15420af	15590me	17790as
		17830as	17885af	21470af	21660af
0800-0830	BBC London	7150pa	9640pa	9660eu	11950af
		11955as	15105af	15280as	17640va
		21715as			
0800-0900	BBS Bahrain	6010me			
0800-0900	CFCX Montreal	6005do			
0800-0900	CFRX Toronto	6070do			
0800-0900	CSM World Svc, Boston	9455va	9840va	13760va	15665va
		17555va			
0800-0900	HCJB Quito	6205pa	9610pa	9745pa	11835pa
		11925pa			
0800-0900 mtwhf	Italian Radio Relay Svc	9815eu			
0800-0900	King of Hope, Lebanon	6280me			
0800-0900	KNLS Anchor Point, Alaska	11715as			
0800-0900	KTWR Guam	15200as			
0800-0810 w	Malawi B'casting Corp.	3381do			
0800-0900 sa	R. E. Africa, Eq. Guinea	9585af			
0800-0900	R. for Peace Int'l	7375na	13630na	15030na	21465na
0800-0900	Radio 1, Accra, Ghana	4915do			
0800-0900 f	Radio 2, Accra, Ghana	3366do			
0800-0900	Radio 2, Zambia	6165do	7235do		
0800-0900	Radio Australia	9710va	15160va	15240va	15365va
		17630va	17750va	21775va	25750va
0800-0810	Radio Bafoussam, Cameroon	4000do			
0800-0900 a	Radio Douala, Cameroon	4795do			
0800-0900	Radio Finland	17800pa	21550pa		
0800-0900	Radio Korea	7550eu	13670eu		
0800-0900	Radio Moscow	7315va	11980va	12010va	12030va
		15140va	15155va	15205va	15280va
		15375va	15450va	15540va	15545va
		15550va	15580va	15590va	17550va
		17560va	17570va	17600va	17615va
		17560va	17570va	17600va	17615va
		1765va	17680va	17690va	17710va
		17730va	17755va	17810va	17815va
		17830va	17850va	21625va	21630va
		21645va	21655va	21715va	21725va
		21740va	21785va	21790va	21845va
0800-0825	Radio Netherlands	9630au	9715au		
0800-0900	Radio New Zealand Int'l	9700pa			
0800-0900	Radio Nigeria	3326do	4990do		
0800-0845	Radio Pakistan	17902eu	21520eu		
0800-0900	Radio Pyongyang	15180as	15230as		
0800-0900 smtwha	RTM Malaysia	7295do			
0800-0900	SBC Radio 1, Singapore	5052do	11940do		
0800-0900	SLBS, Sierra Leone	3316do	5980do		
0800-0900	TWR Monte Carlo	9480eu			
0800-0825	TWR Swaziland	7200af	11750af		
0800-0830	V. of Islam, Bangladesh	15195as	17815as		
0800-0900	VOA Europe	11740eu	15160eu	15195eu	21570eu
		21615eu			
0800-0830	Voice of America	11735va	15160va	15195va	21570va
0800-0830	Voice of America	15195va	21570va	21700va	
0800-0900	Voice of Indonesia	7125as	9675as	11752as	11785as
0800-0900	Voice of Kenya	4935do			
0800-0825	Voice of Malaysia	6175as	9750as	15295as	
0800-0900	Voice of Nigeria	7255af			
0800-0900	WHRI Noblesville	7435eu	9495sa		
0800-0900	WWCR Nashville	7 520am			
0800-0900 smtwhf	ZXLA New Zealand	3935do			
0827-0900	KTWR Guam	11805as			
0830-0900	BBC London	6180eu	6190eu	7325eu	9410eu
		9660eu	9760eu	11860af	11940af
		11955as	12095eu	15070va	15280as
		15360pa	15400af	15420af	15590me
		17640va	17830as	21660af	21715as
0830-0900	BBC London	17885af			
0830-0900	Radio Netherlands	11895pa	17575as	21485as	
0830-0900	RAI Vienna	6155eu	13730eu	15450au	21490as
0830-0900	Swiss Radio Int'l	9560as	13685as	17670as	21695as
0830-0900	Voice of Amercia	11735va	15160va	15195va	21570va
		21700va			
0835-0850 mtwhf	TWR Swaziland	7200af	11750af		
0840-0850 mtwhfa	Voice of Greece	15650au	17525au		



Radio Beijing sent John Hanan of Oklahome City, OK this QSL verifying his reception.

English language

shortwave guide

0900 UTC [4:00 AM EST/1:00 AM PST]

FREQUENCIES

0900-0930	BBC London	1170as	5975eu	6045eu	6180u
		6190af	6195as	7325eu	9410eu
		9660eu	9740as	9750eu	9760eu
		11760me	11860af	11940af	12095eu
		15070va	15400af	17640va	21660af
0900-0930	BBC London	15190sa	15280as	15310as	15360as
		15420af	15575me	15590me	17705eu
		17790af	17830as	17885af	21470af
		21660af	21715as		
0900-1000	BBS Bahrain	6010me			
0900-1000 s	BBS, Bhutan	6035do			
0900-1000	CFCX Montreal	6005do			
0900-1000	CFRX Toronto	6070do			
0900-1000	CKZU Vancouver	6160do			
0900-1000	CSM World Svc, Boston	9455va	9840va	13760va	15665va
		17555va			
0900-0950	Deutsche Welle	6160as	11915as	17780as	17820as
		21465as	21650as	21680as	
0900-0950	Deutsche Welle	9565af	15410af	21600af	
0900-1000	FEBC Manila	9800as	11665as		
0900-1000	HCJB Quito	9745va			
0900-1000 mtwhf	Italian Radio Relay Svc	9815eu			
0900-1000	King of Hope, Lebanon	6280me			
0900-0927	KTWR Guam	15200as			
0900-1000	KTWR Guam	11805as			
0900-0910	Malawi B'casting Corp.	5995do			
0900-1000 sa	R. E. Africa, Eq. Guinea	9585af			
0900-0930	R. for Peace Int'l	7375na	13630na	15030na	21465na
0900-0905	Radio 1, Accra, Ghana	4915do			
0900-0905 f	Radio 2, Accra, Ghana	3366do			
0900-1000	Radio 2, Zambia	6165do	7235do		
0900-1000	Radio Australia	9580va	9710va	9760va	15160va
		15240va	15320va	15365va	25750va
0900-1000	Radio Beijing	11755au	15440au	17710au	
0900-1000	Radio Japan	11840as	21610as		
0900-1000 Ra	Radio Japan, Tokyo	15270au	17890au		
0900-1000	Radio Moscow	7315va	11850va	12010va	12030va
		15140va	15155va	15205va	15320va
		15375va	15405va	15415va	15450va
		15500va	15580va	15590va	17550va
		17560va	17570va	17600va	17615va
0900-1000	Radio Moscow	17625va	17635va	17680va	17690va
		17755va	17760va	17765va	17775va
		17810va	17815va	17850va	17875va
		17895va	17940va	17960va	21625va
		21630va	21645va	21655va	21690va
		21715va	21725va	21740va	21785va
		21790va	21800va	21845va	
0900-0925	Radio Netherlands	11895pa	17575as	21485as	
0900-1000	Radio New Zealand	9700pa			
0900-1000	Radio Nigeria	3326do	4990do		
0900-1000	Radio Tanzania	5985af	9685af	11765af	
0900-0915	Radio Voice of Lebanon	6550me			
0900-1000	RTM Malaysia	7295do			
0900-1000	SBC Radio 1, Singapore	5052do	11940do		
0900-1000	SLBS, Sierra Leone	3316do			
0900-1000	TWR Monte Carlo	9480eu			
0900-1000	VOA Europe	11740eu	15160eu	15195eu	21570eu
		21615eu			
0900-1000	Voice of Kenya	4935do			
0900-1000	Voice of Nigeria	7255af			
0900-1000	WWCR Nashville	7520am			
0900-0930 mtwhf	ZLXA New Zealand	3935do			
0905-1000	Cameroon Radio-TV	4850do			
0905-1000 mtwhf	R. 2 Schools Prg., Ghana	7295do			
0905-1000 sa	Radio 1, Accra, Ghana	4915do			
0905-1000 sa	Radio 2, Accra, Ghana	3366do			
0910-0940 smwha	Ulaanbaatar R., Mongolia		11850pa	12015pa	
0915-0939	Al-Quds Radio (cland.)	5900om	5990om		
0920-1000	BFBS British Forces	15245me	17830me	21745me	
0930-1000	BBC London	5975eu	6045eu	6180eu	6190af
		6195as	9410eu	9660eu	9740as
		9750eu	9760eu	11750as	11760me
		11940af	12095eu	15070va	15310as
		15400af	15420af	15575me	15590me
0930-1000	BBC London	15190sa	17640va	17705eu	
0930-1000	Radio Afghanistan	4940as	9635as	17655as	21600as
0930-1000	Radio Netherland	11895pa			
0930-0940	RTV Togo	7265do			

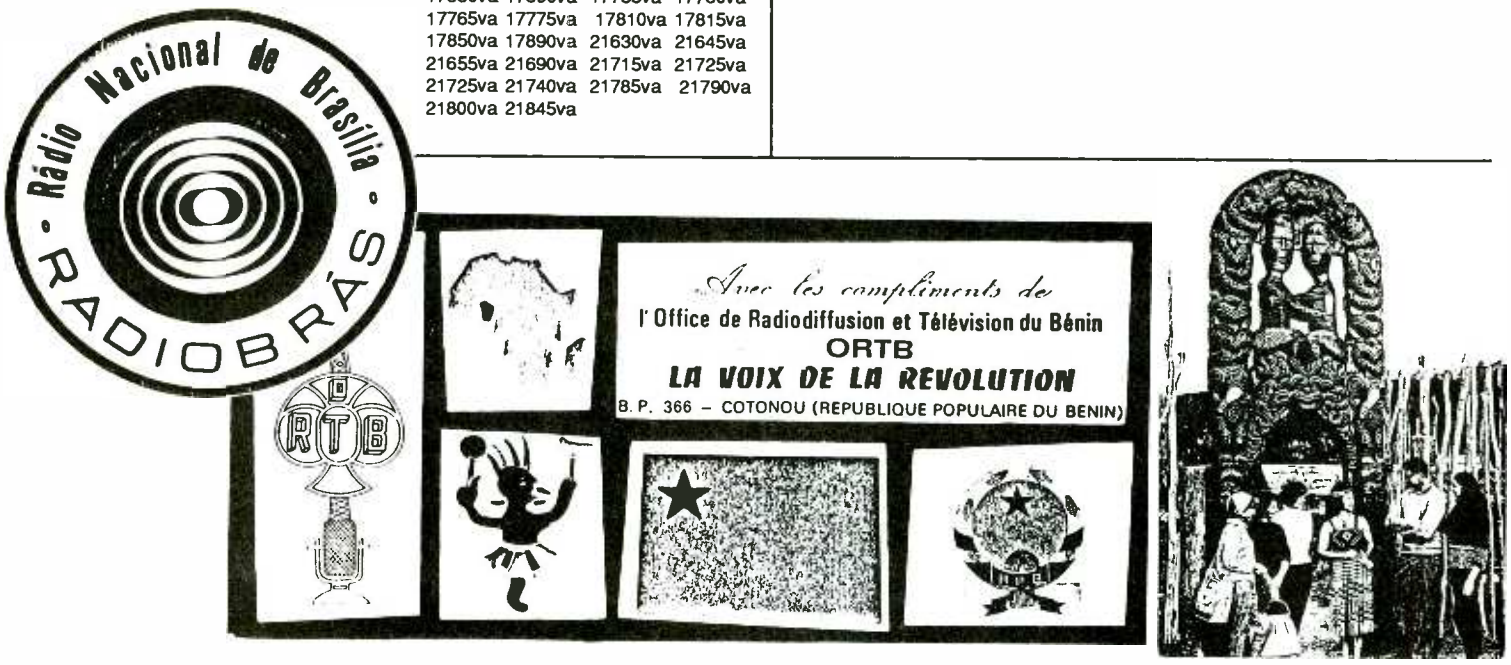
The staff of KSDA, Adventist World Radio's station broadcasting to Asia.

English language **shortwave guide**

1000 UTC [5:00 AM EST/2:00 AM PST]

FREQUENCIES

1000-1100	All India Radio, Delhi	15050as	15335as	17387as	17865as
		21735as			
1000-1030	BBC London	5975eu	6045eu	6180eu	6190af
		6195as	9410eu	9660eu	9740as
		9750eu	9760eu	11750as	11760me
		11940af	12095eu	15070va	15190sa
		15310as	15400af	15420af	15575me
		17640eu	17705eu	17790af	17885af
		21470af	21660af	21715as	
1000-1100	BBS Bahrain	6010me			
1000-1100	Cameroon Radio-TV	4850do			
1000-1100	CFCX Montreal	6005do			
1000-1100	CFRX Toronto	6070do			
1000-1100	CKZU Vancouver	6160do			
1000-1100	CSM World Svc, Boston	9455va	9495va	13625va	13770va
		17555va			
1000-1100	FEBC Manila	9800as	11665as		
1000-1100	HCJB Quito	9745pa	11925pa		
1000-1100 mtwhf	Italian Radio Relay Svc	9815eu			
1000-1100	KSDA Guam	13720as			
1000-1100 mtwhf	R. 2 Schools Prg., Ghana		7295do		
1000-1100 sa	R. E. Africa, Eq. Guinea	9585af			
1000-1100 sa	Radio 1, Accra, Ghana	4915do			
1000-1100 sa	Radio 2, Accra, Ghana	3366do			
1000-1100	Radio 2, Zambia	6165do	7235do		
1000-1030	Radio Afghanistan	4940as	9635as	17655as	21600as
1000-1100	Radio Australia	7140va	9580va	11800va	13605va
		15160va	15170va	15365va	25750va
1000-1100	Radio Beijing	11755au	15440au	17710au	
1000-1100	Radio Moscow	11840na	11850va	12010va	12030va
		15140va	15155va	15320va	15375va
		15405va	15415va	15450va	15500va
		15535va	15540va	15550va	15560va
		15580va	15590va	17560va	17600va
		17615va	17625va	17635va	17655va
		17680va	17690va	17755va	17760va
		17765va	17775va	17810va	17815va
		17850va	17890va	21630va	21645va
		21655va	21690va	21715va	21725va
		21725va	21740va	21785va	21790va
		21800va	21845va		
1000-1025	Radio Netherland	11895pa			
1000-1100	Radio New Zealand	9700pa			
1000-1100	Radio Nigeria	4990do	7285do		
1000-1100	Radio RSA, Johannesburg		17835af		
1000-1030	Radio Tanzania	5985af	9685af	11765af	
1000-1100 mtwh	RTM Malaysia	7295do			
1000-1100	SBC Radio 1, Singapore	5010do	5052do	11940do	
1000-1100	SLBS, Sierra Leone	3316do			
1000-1100	TWR Costa Rica	9725ca			
1000-1015	TWR Monte Carlo	9480eu			
1000-1100	Voice of America	5985as	11720as	11740va	15160va
		15195va	15425as	21570va	21615va
1000-1100	Voice of America	9590ca	11915ca	15120ca	
1000-1100	Voice of Kenya	4935do			
1000-1100	Voice of Nigeria	7255af			
1000-1030	Voice of Vietnam	9755as	12020as		
1000-1100	WWCR Nashville	7520na			
1000-1100	WYFR Okeechobee	1000	5985am	7510am	
1030-1100	AWR Foli, Italy	7230eu			
1030-1100	BBC London	5975eu	6045eu	6180eu	6190af
		6195as	9410eu	9660eu	9740as
		9750eu	9760eu	11750as	11760me
		11940af	12095eu	15070va	15190sa
		15310as	15400af	15420af	15575me
1030-1100	BBC London	17640va	17705eu	17790af	17885af
		21470af	21660af		
1030-1040 mtwhf	Malawi B'casting Corp.	5995do			
1030-1100	Radio Korea	11715na			
1030-1100 sa	Radio Tanzania	5985af	9685af	11765af	
1030-1100	Radio Zambia Int'l	9505af	11880af	17895af	
1030-1100	Sri Lanka B'casting Corp.	11835as	15120as	17850as	
1030-1100	UAE Radio, Dubai	13675eu	15320eu	15435as	21605as
1040-1050 mtwhfa	Voice of Greece	15650as	17535as		



Stewart Todd Morgan of Raleigh, NC sent us these various QSLs and stickers. Center: QSL from La Voix de la Revolution, Benin; left: sticker from Radio Bras, Brazil; right: QSL from Radio New Zealand.

English language

shortwave guide

1100 UTC [6:00 AM EST/3:00 AM PST]

FREQUENCIES

1100-1200	AWR Costa Rica	9725ca			
1100-1130	BBC London	5965na	6045eu	6180eu	6190af
		6195eu	9410eu	9515na	9660eu
		9740as	9750eu	9760eu	11750as
		11760me	11940af	12095eu	15070va
		15310as	15400af	15420af	15575me
1100-1130	BBC London	15220na	17640va	17705eu	17790af
		17885af	21470af	21660af	
1100-1200	BBS Bahrain	6010me			
1100-1125 mtwhf	BRT Brussels	6035eu	13675eu	21810af	
1100-1200	CFCX Montreal	6005do			
1100-1200	CFRX Toronto	6070do			
1100-1200	CSM World Svc, Boston	9455eu	9495eu	13625pa	13770pa
		17555pa			
1100-1150	Deutsche Welle	11890af	15410af	17765af	17800af
		17860af	21600af		
1100-1200	HCJB Quito Ecuador	11925am	15115am	17890am	21455am
1100-1200 mtwhf	Italian Radio Relay Svc	9815eu			
1100-1200	KTBN Salt Lake City	7510na			
1100-1110 sa	Malawi B'casting Corp.	5995do			
1100-1110 mtwhf	R. 2 Schools Prg., Ghana	7295do			
1100-1200	Radio 1, Accra, Ghana	4915do			
1100-1200 sa	Radio 2, Accra, Ghana	3366do			
1100-1200	Radio Australia	6080va	7240va	9580va	9710va
		11800va	11930va	15170va	15365va
		21720va			
1100-1200	Radio Japan	6120na	11815sa	11840na	
1100-1200	Radio Jordan	13655na			
1100-1200	Radio Moscow	9600na	11850va	15140va	15155va
		15320va	15375va	15405va	15450va
		15480va	15500va	15535va	15540va
		15550va	15560va	15590va	17560va
		17570va	17600va	17615va	17680va
		17755va	17760va	17765va	17775va
		17805va	17810va	17815va	17830va
		17890va	21630va	21645va	21655va
		21690va	21715va	21740va	21785va
		21790va	21800va	21845va	
1100-1130	Radio Mozambique	9525af	11818af	11835af	
1100-1120	Radio Pakistan	17902eu	21520eu		
1100-1200	Radio Pyongyang	9977am			
1100-1200	Radio RSA, Johannesburg		9555af	11860af	11900af
1100-1130	Sri Lanka B'casting Corp.	11835as	15120as	17850as	
1100-1130	Swiss Radio Int'l	13635as	15570as	17830as	21770as
1100-1200	TWR Bonaire	11815am	15345am		
1100-1130	Voice of Vietnam	7416as	9732as		
1100-1200	WHRI Noblesville	9465na			
1100-1200	WWCR Nashville	12160na			
1100-1200	WYFR Okeechobee	5950na	7355na	11580ca	
1115-1145	Radio Nepal, Katmandu	3230as	5005as	7165as	
1120-1140	Hunan PBS Changs ha China		4892va		
1125-1130 sa	Radio Botswana	5955af	7255af		
1130-1200	BBC London	5965na	6045eu	6180eu	6190af
		6195eu	9410eu	9515na	9660eu
		9740as	9750eu	9760eu	11750as
		11760me	11940af	12095eu	15070va
		15220na	15310as	15420af	15575me
		17640va	17705eu	17790af	17885af
		21470af			
1130-1200	Radio Beijing	8425as	11445as	12450as	15135as
1130-1140	Radio Lesotho, Masseru	4800do			
1130-1200	Radio Netherlands	5955eu	9715eu	17575eu	21480eu
		21520eu			
1130-1200	Radio Thailand	4830as	9655as	11905as	
1130-1200	RAI Vienna	6155eu	11780as	13730va	15450as
		21490eu			
1130-1145	RTM Malaysia	5950do	7160do		
1130-1145	Vatican Radio	6248eu	9645eu	11740eu	15210eu
1130-1200	Voice of America	9590am	11735me	11915am	15160me
		15225me	21550me	21705me	
1130-1200	VOIRI, Teheran, Iran	7215me	9575as	9695me	11790as
		11930as			
1145-1200	Radiodiffusion du Burundi		6140af		

SELECTED PROGRAMS

Sundays

1105 Christian Science Monitor: Herald of Christian Science. See S 0005.
1110 Voice of America (Caribbean): Critic's Choice. News from the world of the arts.
1110 Voice of America (East Asia): New Horizons. The world of science, medicine, and technology.
1130 BBC: The Ken Bruce Show. See S 0030.
1130 Voice of America (Caribbean): Studio One. Dramatized and narrative documentaries.
1130 Voice of America (East Asia): Issues in the News. Members of the Washington press corps discuss current topics.

Mondays

1106 Christian Science Monitor: Monitor Radio Worldwide. See M 0106.
1110 Voice of America (Caribbean): Focus. A look at the major figures and issues that shape contemporary life.
1110 Voice of America: Science Report (Special English). See M 0040.
1115 Voice of America: This is America (Special English). A look at various unique aspects of American culture.
1130 BBC: Composer Of The Month. See M 0230.
1130 Voice of America (Caribbean): VOA Morning. See S 0010.
1130 Voice of America: Music, UA. (Standards). Classics of American popular music.
1134 Christian Science Monitor: Letterbox. See M 0134.
1148 Christian Science Monitor: Religious Article. See M 0148.

Tuesdays

1106 Christian Science Monitor: Monitor Radio Worldwide. See M 0106.
1110 Voice of America (Caribbean): Focus. See M 1110.
1110 Voice of America (Special English): Agriculture Report. Developments in agriculture.
1115 Voice of America (Special English): Science in the News. The role of science in everyday life.
1130 BBC: Megamix. Music, sports, fashion, health, travel, news, and opinion for young people.
1130 Voice of America (Caribbean): VOA Morning. See S 0010.
1130 Voice of America: Now Music, UA. Rock and soul music from old favorites to the latest hits, and profiles of the stars.
1134 Christian Science Monitor: Letterbox. See M 0134.
1148 Christian Science Monitor: Religious Article. See M 0148.

Wednesdays

1106 Christian Science Monitor: Monitor Radio Worldwide. See M 0106.
1110 Voice of America (Caribbean): Focus. See M 1110.
1110 Voice of America: Science Report (Special English). See M 0040.
1115 Voice of America: Space and Man (Special English). Various aspects of life in space.
1130 BBC: Meridian. See W 0630.
1130 Voice of America (Caribbean): VOA Morning. See S 0010.
1130 Voice of America: Now Music, UA. See T 1130.
1134 Christian Science Monitor: Letterbox. See M 0134.
1148 Christian Science Monitor: Religious Article. See M 0148.

Thursdays

1106 Christian Science Monitor: Monitor Radio Worldwide. See M 0106.
1110 Voice of America (Caribbean): Focus. See M 1110.
1110 Voice of America: Science Report (Special English). See M 0040.
1115 Voice of America: The Making of a Nation (Special English). See H 0045.
1130 BBC: Drama. This month, hear the conclusion of Ingmar Bergman's "Scenes From A Marriage" (7th), followed by recreations of "Murder Most Foul" (through December 19th).
1130 Voice of America (Caribbean): VOA Morning. See S 0010.
1130 Voice of America: Now Music, UA. See T 1130.
1134 Christian Science Monitor: Letterbox. See M 0134.
1148 Christian Science Monitor: Religious Article. See M 0148.

Fridays

1106 Christian Science Monitor: Monitor Radio Worldwide. See M 0106.
1110 Voice of America (Caribbean): Focus. See M 1110.
1110 Voice of America: Science Report (Special English). See M 0040.
1115 Voice of America: American Mosaic (Special English). A feature program in s-l-o-w English.
1130 BBC: Meridian. See W 0630.
1130 Voice of America (Caribbean): VOA Morning. See S 0010.
1130 Voice of America: Country Music, UA. Current popular country music tunes with a sprinkling of old favorites.
1134 Christian Science Monitor: Letterbox. See M 0134.
1148 Christian Science Monitor: Religious Article. See M 0148.

Saturdays

1105 Christian Science Monitor: Herald of Christian Science. See S 0005.
1110 Voice of America (Caribbean): American Viewpoints. See S 0010.
1110 Voice of America: Focus. See M 1110.
1130 BBC: Meridian. See W 0630.
1130 Voice of America (Caribbean): Music, UA. (Jazz). Willis Conover looks at jazz of yesterday and today, in the UA. and abroad.
1130 Voice of America: Press Conference, UA. See S 0130.

1200 UTC [7:00 AM EST/4:00 AM PST]

FREQUENCIES

1200-1300	ABC Perth	9610na				
1200-1300	AWR Costa Rica	9725ca				
1200-1230	BBC London	6045eu	6180eu	6190af	6195eu	
		9410eu	9515na	9660eu	9740na	
		9750eu	9760eu	11750as	11760me	
		11940af	12095eu	15070eu	15220na	
		15310as	15420af	15575me	17640va	
		17705eu	17790af	17885af	21470af	
		21660af				
1200-1300	BBS Bahrain	6010me				
1200-1300	CFCX Montreal	6005do				
1200-1300	CFRX Toronto	6070do				
1200-1300	CKZU Vancouver	6160do				
1200-1300	CSM World Svc, Boston	9495am	13625am	13760am	15665am	
		21670pa				
1200-1300	HCJB Quito	11925am	15115am	17890am	21455om	
1200-1300 mtwhf	Italian Radio Relay Svc	9815eu				
1200-1300	KTBN Salt Lake City	7510am				
1200-1210 w	Malawi B'casting Corp.	3381do	5995do			
1200-1300 sa	R. E. Africa, Eq. Guinea	9585af				
1200-1300	Radio 1, Accra, Ghana	4915do				
1200-1225 sa	Radio 2, Accra, Ghana	3366do				
1200-1300	Radio Australia	5995va	6080va	7240va	9580va	
		9710va	11720pa	11800va	11930va	
		21520pa	21720va			
1200-1300	Radio Beijing	8425as	11600as	11660as	11855as	
		15450as	17855na			
1200-1300 mtwhf	Radio Canada Int'l	9635am	11855am	17820am		
1200-1300 mtwhf	Radio Douala, Cameroon		4795do			
1200-1300	Radio Jordan	13655me				
1200-1300	Radio Korea	9750na				
1200-1230	Radio Mogadishu, Somalia		6095af			
1200-1300	Radio Moscow	9600na	11900na	11940va	12025va	
		15110va	15140va	15155va	15205va	
		15220na	15375va	15460na	15480va	
		15500va	15540va	15550va	17610na	
		17655va	17670na	17760va	17765va	
		17805va	17810va	17815va	17830va	
		21630va	21645va	21655va	21690va	
		21715va	21740va	21785va	21790va	
		21800va	21845va			
1200-1225	Radio Netherlands	5955eu	9715eu	17575eu	21480eu	
		21520eu				
1200-1210	Radio New Zealand	9700pa				
1200-1300	Radio Nigeria	4990do	7285do			
1200-1230 as	Radio Norway	21695as	25730as			
1200-1230	Radio Polonia, Warsaw	9535eu	11815eu			
1200-1230	Radio Romania Int'l	15365as	15390as	17720as		
1200-1300 sa	Radio Tanzania	5985af	9684af	11765af		
1200-1230	Radio Tashkent	7325as	9715as	15460as		
1200-1230	Radio Thailand	4830as	9655as	11905as		
1200-1230 s	Radio Zambia Int'l	9505af	11880af	17895af		
1200-1300	RTM Malaysia	7295do				
1200-1300	SBC Radio 1, Singapore	5010do	5052do	11940do		
1200-1300	SLBS, Sierra Leone	3316do	5980do			
1200-1300	TWR Bonaire	11815am	15345am			
1200-1230 smwha	Ulaanbaatar R., Mongolia		11850as	12015as		
1200-1215	V. of Cambodia	9695as	11938as			
1200-1230 mtwhf	Vatican Radio	17865as	21515as			
1200-1230	Voice of America	6110as	9760as	11715as	15155as	
		15425as				
1200-1300	Voice of Kenya	4935do				
1200-1300	Voice of Nigeria	7255af				
1200-1230	VOIRI, Teheran, Iran	7215me	9575as	9695me	11790as	
		11930as				
1200-1300	WHRI Noblesville	9465am				
1200-1300	WWCR Nashville	12160am	15690am			
1200-1300	WWCR Nashville	15690na				
1200-1300	WYFR Okeechobee	5950am	6015am	11580am	17750am	
1215-1230	Radio Bayrak, Cyprus	6150va				
1215-1300	Radio Cairo	17595as				
1215-1300	Radio Korea	9750am				
1226-1300	Radio 2, Accra, Ghana	7295do				
1230-1300	BBC London	6045eu	6180eu	6190af	6195ca	
		9410eu	9515na	9660eu	9740na	
		9750eu	9760eu	11760me	11940af	
		12095eu	12170as	15070eu	15220na	
		15310as	15420af	15575me	17640va	
		17705eu	17790af	17885af	21470af	
		21660af				
1230-1300	Radio Bangladesh	15200as	15605as	15647as	17750as	
1230-1300	Radio Federal Yugoslavia		17740na	21605as		
1230-1300 mtwhf	Radio Finland	15400na	21550na			
1230-1300	Radio France Int'l	9805eu	11670eu	15155eu	15195eu	
		21635na	21645na			
1230-1300	Sri Lanka B'casting Corp.		6075as	9720as		
1230-1300	Voice of America	6110as	9760as	11715as	15155as	
		15425as				
1230-1300	Voice of Vietnam	9840as	12020as	15010as		
1235-1245	Voice of Greece	15550am	15650am	17525am		

SELECTED PROGRAMS

Sundays

1201 BBC: Play Of The Week. See S 0101.
1205 Christian Science Monitor: Herald of Christian Science. See S 0005.
1210 Voice of America: Encounter. A discussion program presenting opinions on world issues.
1230 Voice of America: Studio One. See S 1130.

Mondays

1206 Christian Science Monitor: News Features. See M 0006.
1210 Voice of America: Newsline. See S 2310.
1215 BBC: Quiz. This month, hear "My Word" (through December 9th), the ever-popular quiz about words.
1230 Voice of America: Magazine Show. Features about culture, science, sports, medicine, and the arts in America.
1245 BBC: Sports Roundup. See S 0315.

Tuesdays

1206 Christian Science Monitor: News Features. See M 0006.
1210 Voice of America: Newsline. See S 2310.
1215 BBC: Multitrack 1: Top 20. See M 2330.
1230 Voice of America: Magazine Show. See M 1230.
1245 BBC: Sports Roundup. See S 0315.

Wednesdays

1206 Christian Science Monitor: News Features. See M 0006.
1210 Voice of America: Newsline. See S 2310.
1215 BBC: New Ideas. See M 1615.
1230 Voice of America: Magazine Show. See M 1230.
1235 BBC: Talks. See M 1635.
1245 BBC: Sports Roundup. See S 0315.

Thursdays

1206 Christian Science Monitor: News Features. See M 0006.
1210 Voice of America: Newsline. See S 2310.
1215 BBC: Multitrack 2. See W 2330.
1230 Voice of America: Magazine Show. See M 1230.
1245 BBC: Sports Roundup. See S 0315.

Fridays

1206 Christian Science Monitor: News Features. See M 0006.
1210 Voice of America: Newsline. See S 2310.
1215 BBC: Feature. Hear a re-run on scientific detectives in "The Modern Sherlock Holmes" (1st/8th); also re-run this month is "The Amazon Watershed" (15th/22nd/29th).
1230 Voice of America: Magazine Show. See M 1230.
1245 BBC: Sports Roundup. See S 0315.

Saturdays

1205 Christian Science Monitor: Herald of Christian Science. See S 0005.
1210 Voice of America: Communications World. See S 0110.
1215 BBC: Multitrack 3. See F 2330.
1230 Voice of America: Weekend Magazine. See S 0030.
1245 BBC: Sports Roundup. See S 0315.

English language

shortwave guide

1300 UTC [8:00 AM EST/5:00 AM PST]

FREQUENCIES

1300-1400	ABC Perth	9610
1300-1330	BBC London	5975eu 6045eu 6180eu 6190af 6195ca 9410eu 9515na 9660eu 9740as 9750eu 9760eu 11750as 11760me 11820as 11940af 12095eu 15070va 15310as 15420af 15575me
1300-1330	BBC London	7180as 15220na 17640va 17705eu 17790af 17885af 21470af 21660af
1300-1400	BBS Bahrain	6010me
1300-1325 mtwhf	BRT Brussels	21810na
1300-1400	CFCX Montreal	6005do
1300-1400	CFRX Toronto	6070do
1300-1400	CKZU Vancouver	6160do
1300-1400	CSM World Svc, Boston	9495as 13625pa 13760pa 15665pa 21670pa
1300-1400	FEBC Manila	11685pa
1300-1400	FEBC Manila	11850as
1300-1400	HCJB Quito	11925am 15115am 17890am 21455am
1300-1400 mtwhf	Italian Radio Relay Svc	9815eu
1300-1400	KTBN Salt Lake City	7510
1300-1400 sa	R. E. Africa, Eq. Guinea	9585af
1300-1400	Radio 1, Accra, Ghana	4915do
1300-1400	Radio 2, Accra, Ghana	7295do
1300-1400	Radio Australia	5995va 6080va 7240va 9580va 9710va 9770va 11720va 21720va
1300-1400	Radio Beijing	9670as 11600as 11660na 11855na
1300-1330	Radio Cairo	17595as
1300-1400 s	Radio Canada Int'l	11955am 17820am
1300-1330 mtwhf	Radio Douala, Cameroon	4795do
1300-1315	Radio Jordan	13655na
1300-1400	Radio Jordan	13655na
1300-1315	Radio Korea	9750na
1300-1400	Radio Moscow	7175va 7315va 7370va 9785va 9885va 11685va 11840na 11900am 12025va 12030va 12070va 15110va 15155va 15205va 15375va 15405va 15480va 15500va 15540va 15550va 15590va 15595va 17560va 17595va 17630va 17635va 17655va 17670va 17760va 17805va 17810va 17815va 17830va 17890va 17940va 21630va 21645va 21690va 21715va 21740va 21785va 21790va 21845va
1300-1400	Radio Nigeria	4990do 7285do
1300-1330 as	Radio Norway	9590eu 25730eu
1300-1400	Radio Pyongyang	9325eu 9345eu 9640as 13650as 15230as
1300-1400	Radio Romania Int'l	11940eu 15365eu 17720eu 17850eu
1300-1400 sa	Radio Tanzania	5985af 9684af 11765af
1300-1400	RTM Malaysia	7295do
1300-1400	SBC Radio 1, Singapore	5010do 5052do 11940do
1300-1400	SLBS, Sierra Leone	3316do 5980do
1300-1400	Sri Lanka B'casting Corp.	6075as 9720as
1300-1330	Swiss Radio Int'l	6165eu 9535eu 12030eu
1300-1330	TWR Boniare	11815am 15345am
1300-1330	Voice of America	6110as 9760as 11715as 15155as 15245as 15280as
1300-1325	Voice of Kenya	4935do
1300-1400	Voice of Nigeria	7255af
1300-1400	WHRI Noblesville	9465 11790
1300-1400	WWCR Nashville	15690
1300-1400	WYFR Okeechobee	5950am 6015am 11580am 17750af
1315-1330	Radio Voice of Lebanon	5me 6549.5
1325-1400 mtwhf	Voice of Kenya	4935do
1330-1400	All India Radio, Delhi	9565as 11760as 15335as
1330-1400	BBC London	5975eu 6045eu 6180eu 6190af 6195ca 9410eu 9515na 9660eu 9740as 9750eu 9760eu 11750as 11820as 11940af 12095eu 15070va 15220na 15310as 15420af 15575me
1330-1400	BBC London	7180as 17640va 17705eu 17790af 17885af 21470af 21660af
1330-1355 S	BRT Brussels	21810na
1330-1400	Kol Israel	11587am 11605am 17575as 17590as
1330-1400	Nat'l Radio of Laos	7112as
1330-1400	Radio Canada Int'l	6095as 9535as 9700as 11795as
1330-1400	Radio Douala, Cameroon	4795do
1330-1400	Radio Finland	15400na 21550na
1330-1400 a	Radio Republik Indonesia	3385do 6070do
1330-1400	Radio Sweden	17740as 21570as
1330-1400	Radio Tashkent	7325as 9715as 15460as
1330-1400	RAI Vienna	11780as 15450as
1330-1400	Swiss Radio Int'l	7480as 11695as 13635as 15570as 17830as 21695as
1330-1400	UAE Radio, Dubai	13675eu 15320eu 15435as 21605as
1330-1400	Voice of America	6110as 9760as 15155as 15425as
1330-1400	Voice of Turkey	9675eu
1330-1400	Voice of Vietnam	9840as 12020as 15010as

SELECTED PROGRAMS

Sundays

1305 Christian Science Monitor: Herald of Christian Science. See S 0005.
1310 Voice of America: Critic's Choice. News from the world of the arts.
1340 Voice of America: Words and Their Stories (Special English). See S 0040.
1345 Voice of America: People in America (Special English). A feature program about America's diverse people.

Mondays

1306 Christian Science Monitor: Monitor Radio Worldwide. See M 0106.
1310 Voice of America: Focus. See M 1110.
1334 Christian Science Monitor: Letterbox. See M 0134.
1340 Voice of America: Science Report (Special English). See M 0040.
1345 Voice of America: This is America (Special English). See M 1115.
1348 Christian Science Monitor: Religious Article. See M 0148.

Tuesdays

1306 Christian Science Monitor: Monitor Radio Worldwide. See M 0106.
1310 Voice of America: Focus. See M 1110.
1334 Christian Science Monitor: Letterbox. See M 0134.
1340 Voice of America (Special English): Agriculture Report. See T 1110.
1345 Voice of America (Special English): Science in the News. See T 1115.
1348 Christian Science Monitor: Religious Article. See M 0148.

Wednesdays

1306 Christian Science Monitor: Monitor Radio Worldwide. See M 0106.
1310 Voice of America: Focus. See M 1110.
1334 Christian Science Monitor: Letterbox. See M 0134.
1340 Voice of America: Science Report (Special English). See M 0040.
1345 Voice of America: Space and Man (Special English). See W 1115.
1348 Christian Science Monitor: Religious Article. See M 0148.

Thursdays

1306 Christian Science Monitor: Monitor Radio Worldwide. See M 0106.
1310 Voice of America: Focus. See M 1110.
1334 Christian Science Monitor: Letterbox. See M 0134.
1340 Voice of America: Science Report (Special English). See M 0040.
1345 Voice of America: The Making of a Nation (Special English). See H 0045.
1348 Christian Science Monitor: Religious Article. See M 0148.

Fridays

1306 Christian Science Monitor: Monitor Radio Worldwide. See M 0106.
1310 Voice of America: Focus. See M 1110.
1334 Christian Science Monitor: Letterbox. See M 0134.
1340 Voice of America: Science Report (Special English). See M 0040.
1345 Voice of America: American Mosaic (Special English). See F 1115.
1348 Christian Science Monitor: Religious Article. See M 0148.

Saturdays

1305 Christian Science Monitor: Herald of Christian Science. See S 0005.
1310 Voice of America: American Viewpoints. See S 0010.
1340 Voice of America: Words and Their Stories (Special English). See S 0040.
1345 Voice of America: American Stories (Special English). See S 0045.

1400 UTC [9:00 AM EST/6:00 AM PST]

FREQUENCIES

1400-1500	All India Radio, Delhi	9565as	11760as	15335as	
1400-1430	BBC London	5975eu	6045eu	6180eu	6190af
		6195as	9410eu	9660eu	9740as
		9750eu	9760eu	11750as	11820as
		11940af	12095eu	15070eu	15310as
		15575me	17640va	17705eu	17790af
1400-1430	BBC London	7180as	17880af	21470af	21660af
1400-1500	BBS Bahrain	6010me			
1400-1425	BRT Brussels	21810na			
1400-1500	Cameroon Radio-TV	4850na			
1400-1500	CFCX Montreal	6005do			
1400-1500	CFRX Toronto	6070do			
1400-1500	CSM World Svc, Boston	9530pa	13625pa	13760pa	15665pa
		21670pa			
1400-1500	FEBC Manila	11685pa			
1400-1500	FEBC Manila	11850as			
1400-1500	HCJB Quito	11925na	15115na	17890na	21455na
1400-1500	King of Hope, Lebanon	6280me			
1400-1500	KTBN Salt Lake City	7510ww			
1400-1410	Malawi B'casting Corp.	3381do			
1400-1500	R. for Peace Int'l	7375am	13630am	15030am	21465am
1400-1500	Radio 1, Accra, Ghana	4915do			
1400-1500	Radio 2, Accra, Ghana	7295do			
1400-1500	Radio Australia	5995va	6080va	7240va	9580va
		9710va	11720va	17630va	
1400-1500	Radio Beijing	4200as	11815as	11855na	15165na
1400-1430	Radio Canada Int'l	11935eu	15305eu	15315eu	15325eu
		17795eu	17820eu	21545eu	
1400-1500 s	Radio Canada Int'l	11955	17820		
1400-1430	Radio Douala, Cameroon	4795do			
1400-1430	Radio Finland	6120eu	11755eu	11820eu	15185eu
		21550eu			
1400-1430 as	Radio Finland	15400na	21550na		
1400-1500	Radio France Int'l	11910as	17650as	21770as	
1400-1500	Radio Japan	9505am	9535am	11815as	
1400-1410	Radio Juba, Sudan	9540do	9550do		
1400-1500	Radio Korea	9570as			
1400-1500	Radio Moscow	7370va	9785va	11765va	11840na
		11850va	11870va	11905va	12025va
		12030va	12050va	15140va	15180va
		15205va	15375va	15560va	17570va
		17635va	17655va	17670va	17810va
		17815va	17890va	21505va	21630va
		21645va	21690va	21740va	21785va
		21790va	21845va		
1400-1500	Radio Nigeria	4990do	7285do		
1400-1500 sa	Radio Tanzania	5985af	9684af	11765af	
1400-1500	RTM Malaysia	7295do			
1400-1500	SBC Radio 1, Singapore	5010do	5052do	11940do	
1400-1500	SLBS, Sierra Leone	3316do	5980do		
1400-1500	Sri Lanka B'casting Corp.	6075as	9720as		
1400-1430	Swiss Radio Int'l	6165eu	9535eu	12030eu	
1400-1500	VLW6 Wanneroo, Australia		6140		
1400-1500	Voice of America	6110as	7125as	9645as	9760as
		15160as	15205as	15395as	15425
1400-1500 mtwhf	Voice of Kenya	4935do			
1400-1500	Voice of Nigeria	7255af			
1400-1500	WHRI Noblesville	9465na	15105na		
1400-1500	WRNO New Orleans	15420na			
1400-1500	WWCR Nashville	12160na	15690am		
1400-1500	WYFR Okeechobee	6015na	11580sa	17750af	
1415-1500	BBS, Bhutan	5023do			
1415-1425	RTV Mali, Kathmandu	3230do	5005do	7165do	
1420-1500	Radio Jordan	9560??			
1430-1500	BBC London	5975eu	6045eu	6180eu	6190af
		6195as	9410eu	9740as	9750eu
		9760eu	11750as	11820as	11940af
		12095eu	15070va	15310as	15575me
		17640va	17705eu	17790af	17880af
1430-1500	BBC London	7180as	21470af	21660af	
1430-1500	Guizhou PBS Gulyang China		3260do	7275do	
1430-1500 mtwhfa	Radio Douala, Cameroon	4795do			
1430-1500 mtwhf	Radio Finland	15400am	21550am		
1430-1500	Radio Netherlands	5955eu	13770eu	15150eu	17575eu
		17605eu			
1430-1500	Radio Polonia, Warsaw	6095eu	6135eu	7285eu	9525eu
1430-1500	Voice of Myanmar	5990do			
1435-1450	Nei MongolPBS Hohot China		3970do	7105do	
1440-1450 mtwhfa	R Nacional de Venezuela	9540om			
1445-1500 smwha	Ulaanbaatar R., Mongolia	9575as	13780as		
1445-1500	Vatican Radio	6248eu	9645eu	11740eu	

SELECTED PROGRAMS

Sundays

1401 BBC: Feature. This month, hear eastern European music on "Eastern Approaches" (3rd) and a re-run of a series on "Colors" (through December 1st).
1405 Christian Science Monitor: Herald of Christian Science. See S 0005.
1410 Voice of America: The Concert Hall. Classical music and interviews with America's great artists and conductors.
1430 BBC: Anything Goes. Bob Holness presents a variety of music and other recordings.
1455 Voice of America: Editorial. American opinion.

Mondays

1405 BBC: Outlook. Conversation, controversy, and color from the UK and the world.
1406 Christian Science Monitor: News Features. See M 0006.
1410 Voice of America: Asia Report. News, correspondent reports, interviews, and opinion.
1430 BBC: Off The Shelf. See M 0430.
1445 BBC: Talks. Foreign journalists present personal "Images of Britain" (through December 9th).
1455 Voice of America: Editorial. See S 1455.

Tuesdays

1405 BBC: Outlook. See M 1405.
1406 Christian Science Monitor: News Features. See M 0006.
1410 Voice of America: Asia Report. See M 1410.
1430 BBC: Off The Shelf. See M 0430.
1445 BBC: Classical Music. See M 0145.
1455 Voice of America: Editorial. See S 1455.

Wednesdays

1405 BBC: Outlook. See M 1405.
1406 Christian Science Monitor: News Features. See M 0006.
1410 Voice of America: Asia Report. See M 1410.
1430 BBC: Off The Shelf. See M 0430.
1445 BBC: Good Books. Recommendations of books to read.
1455 Voice of America: Editorial. See S 1455.

Thursdays

1405 BBC: Outlook. See M 1405.
1406 Christian Science Monitor: News Features. See M 0006.
1410 Voice of America: Asia Report. See M 1410.
1430 BBC: Off The Shelf. See M 0430.
1445 BBC: Recording Of The Week. See M 0545.
1455 Voice of America: Editorial. See S 1455.

Fridays

1405 BBC: Outlook. See M 1405.
1406 Christian Science Monitor: News Features. See M 0006.
1410 Voice of America: Asia Report. See M 1410.
1430 BBC: Off The Shelf. See M 0430.
1445 BBC: Talks. See S 0445.
1455 Voice of America: Editorial. See S 1455.

Saturdays

1401 BBC: John Peel. See T 0330.
1405 Christian Science Monitor: Herald of Christian Science. See S 0005.
1410 Voice of America: Music, UA. (Jazz). See A 1130.
1430 BBC: Sportsworld. Shortwave's "Wide World Of Sports" with Paddy Feeny.
1455 Voice of America: Editorial. See S 1455.

English language

shortwave guide

1500 UTC [10:00 AM EST/7:00 AM PST]

FREQUENCIES

1500-1530	BBC London	3915as	5975eu	6045eu	6180eu
		6190af	6195eu	6195as	9410eu
		9740na	9750eu	9760eu	11750as
		11775na	11940af	12095eu	15070va
		15310as	15400af	15420af	15575me
1500-1530	BBC London	7180as	15260na	17640va	17705eu
		17790af	17860af	17880af	21470af
		21490af	21660af		
1500-1600	BBS Bahrain	6010me			
1500-1600	Cameroon Radio-TV	4850do			
1500-1600	CFCX Montreal	6005do			
1500-1600	CFRX Toronto	6070do			
1500-1600	CSM World Svc, Boston	9530pa	13625pa	13760pa	15665pa
		21670pa			
1500-1550	Deutsche Welle	9735af	11965af	13610af	17735af
		17765af	21600af		
1500-1555	FEBA Seychelles	11865af			
1500-1600 whfa	FEBA Seychelles	9590as	15330af		
1500-1600	FEBA Seychelles	9590as	11865as	15330as	
1500-1600	FEBC Manila	11685as			
1500-1600	HCJB Quito	11925na	15115na	17890na	21455na
1500-1600	KNLS Anchor Point, Alaska		9615as		
1500-1600	KTBN Salt Lake City	15590na			
1500-1600	KTWR Guam	11650as			
1500-1600	R. for Peace Int'l	7375am	13630am	15030am	21465am
1500-1600	Radio 1, Accra, Ghana	4915do			
1500-1600	Radio 2, Accra, Ghana	7295do			
1500-1600	Radio Australia	5995va	6080va	7240va	9580va
		9710va	9770va	11720va	12000va
		13745va	17630va		
1500-1600	Radio Bangladesh	4880do			
1500-1600	Radio Beijing	4200as	11815as	11855am	15165am
1500-1530	Radio Canada Int'l	11935eu	15305eu	15325eu	17820eu
		21545eu			
1500-1600 s	Radio Canada Int'l	11955	17820		
1500-1600	Radio Japan	9505am			
1500-1600	Radio Moscow	6065va	7315va	9865va	11695va
		11840na	11890va	11900va	11995va
		12005va	12015va	12025va	12030va
		12050va	12070va	15140va	15180va
		15205va	15375va	15465va	15480va
		15500va	15540va	15560va	15580va
		15595va	17560va	17600va	17610na
		17655va	17670va	17755va	17775va
		17795va	17810va	17815va	21615va
		21625va	21645va	21690va	21740va
		21785va	21790va	21845va	
1500-1525	Radio Netherlands	5955eu	13770eu	15150eu	17575ee
		17605eu			
1500-1600	Radio Nigeria	4990do	7285do		
1500-1530 as	Radio Norway	11870na			
1500-1600	Radio Pyongyang	9325va	9640va	9977va	11760va
1500-1530	Radio Romania Int'l	11940as	15250as	15335as	17720as
		17745as	17775as		
1500-1600	Radio RSA, Johannesburg		7230af	15270af	
1500-1530 sa	Radio Tanzania	5985af	9684af	11765af	
1500-1600	RTM Malaysia	7295do			
1500-1600	SBC Radio 1, Singapore	5010do	5052do	11940do	
1500-1600	SLBS, Sierra Leone	3316do	5980do		
1500-1600	Sri Lanka B'casting Corp.		6075as	9720as	
1500-1515 smwha	Ulaanbaatar R., Mongolia		9575as	13780as	
1500-1600	Voice of America	7125as	9645as	9700as	15205va
		15260as	15395as		
1500-1600	Voice of Ethiopia	7165af			
1500-1600 mtwhf	Voice of Kenya	4935do			
1500-1600	Voice of Myanmar	5990do			
1500-1600	Voice of Nigeria	7255af			
1500-1600	WHRI Noblesville	15105na	21840sa		
1500-1600	WRNO New Orleans	15420na			
1500-1600	WWCR Nashville	15690am	17525am		
1500-1600	WYFR Okeechobee	11580na	11830na	17750af	
1523-1530	R. Veritas Asia, Manila	15140as			
1530-1600	BBC London	6190af	6195eu	6195as	7180as
		9410eu	9740na	9750eu	11750as
		11775na	11940af	12095eu	15070va
		15260as	15310as	15400af	17640va
		17705eu	17880af	21470af	21660af
1530-1600	Radio Sweden	17870na	21500na		
1530-1600	Radio Tanzania	5985af	9684af	11765af	
1530-1600	Radio Tirana	9580af	11825af		
1530-1600	Radio Zambia Int'l	9505af	11880af	17895af	
1530-1600	RAI Vienna	6155eu	11780as	13730eu	21490va
1530-1600	Sudan Nat'l B'casting Cor		9540do	9550do	11635do
1530-1600	Swiss Radio Int'l	13685af	15430af	17830af	21630af
1530-1600 mtwha	Vatican Radio	6185eu			
1530-1540 mtwhfa	Voice of Greece	11645eu	15550am	17525am	
1545-1600	Vatican Radio	11715as	15090as	17870as	

SELECTED PROGRAMS

Sundays

1505 Christian Science Monitor: Herald of Christian Science. See S 0005.
1510 Voice of America: New Horizons. See S 1110.
1515 BBC: Concert Hall. Classical music recordings from the world's great concert halls.
1530 Voice of America: Studio One. See S 1130.

Mondays

1506 Christian Science Monitor: Monitor Radio Worldwide. See M 0106.
1510 Voice of America: Newsline. See S 2310.
1515 BBC: Feature/Drama. See M 0101.
1530 Voice of America: Magazine Show. See M 1230.
1534 Christian Science Monitor: Letterbox. See M 0134.
1548 Christian Science Monitor: Religious Article. See M 0148.

Tuesdays

1506 Christian Science Monitor: Monitor Radio Worldwide. See M 0106.
1510 Voice of America: Newsline. See S 2310.
1515 BBC: A Jolly Good Show. Dave Lee Travis presents listener rock music requests.
1530 Voice of America: Magazine Show. See M 1230.
1534 Christian Science Monitor: Letterbox. See M 0134.
1548 Christian Science Monitor: Religious Article. See M 0148.

Wednesdays

1506 Christian Science Monitor: Monitor Radio Worldwide. See M 0106.
1510 Voice of America: Newsline. See S 2310.
1515 BBC: Talks. See M 2315.
1530 BBC: Comedy Show. This month, Stewart Collins presents humorous songs and sketches in "It's A Funny Old World."
1530 Voice of America: Magazine Show. See M 1230.
1534 Christian Science Monitor: Letterbox. See M 0134.
1548 Christian Science Monitor: Religious Article. See M 0148.

Thursdays

1506 Christian Science Monitor: Monitor Radio Worldwide. See M 0106.
1510 Voice of America: Newsline. See S 2310.
1515 BBC: Music With Matthew. Brian Matthew with classical music selections.
1530 Voice of America: Magazine Show. See M 1230.
1534 Christian Science Monitor: Letterbox. See M 0134.
1548 Christian Science Monitor: Religious Article. See M 0148.

Fridays

1506 Christian Science Monitor: Monitor Radio Worldwide. See M 0106.
1510 Voice of America: Newsline. See S 2310.
1515 BBC: Music Review. See H 2315.
1530 Voice of America: Magazine Show. See M 1230.
1534 Christian Science Monitor: Letterbox. See M 0134.
1548 Christian Science Monitor: Religious Article. See M 0148.

Saturdays

1505 Christian Science Monitor: Herald of Christian Science. See S 0005.
1510 Voice of America: Focus. See M 1110.
1515 BBC: Sportsworld. See A 1430.
1530 Voice of America: Press Conference, UA. See S 0130.

English language

shortwave guide

1600 UTC [11:00 AM EST/8:00 AM PST]

FREQUENCIES

1600-1630	BBC London	1540af	3915as	5975as	6190af
		6195eu	9410eu	9630af	9740me
		9750eu	11750as	11775na	11940af
		12095eu	15070eu	15400af	17640va
		17695eu	17705eu	17860af	17880af
1600-1630	BBC London	7180as	15260na	15310as	21470af
		21660af			
1600-1700	BBS Bahrain	6010me			
1600-1700	BSKSA Saudi Arabia	9705eu	9720eu		
1600-1700	CFCX Montreal	6005do			
1600-1700	CFRX Toronto	6070do			
1600-1700	CSM World Svc, Boston	11580as	13625as	15665am	17555am
		21640af			
1600-1650	Deutsche Welle	6170as	7225as	15105as	15415as
		15595as	17810as	21680as	
1600-1630	HCJB Quito	11925am	15115am	17890am	21455am
1600-1700	KSDA Guam	11980as			
1600-1700	KTBN Salt Lake City	15590am			
1600-1635	KTWR Guam	11650as			
1600-1610	Malawi B'casting Corp.	3381do			
1600-1700	Radio 1, Accra, Ghana	4915do			
1600-1700	Radio 2, Accra, Ghana	7295do			
1600-1700	Radio Australia	5995va	6060va	6080va	7240va
		9580va	11910va	12000va	13605va
		13745va	17630va		
1600-1700	Radio Beijing	4130af	11575af	15110af	15130af
1600-1630	Radio Canada Int'l	11935eu	15305eu	15325eu	17820eu
		21545eu			
1600-1700	Radio France Int'l	6175eu	11705af	12015af	15530me
		17620af	17795af	17850af	
1600-1700	Radio Korea	5975om	9870af		
1600-1610	Radio Lesotho	4800do			
1600-1700	Radio Moscow	6065va	7305va	7330va	7370va
		9480va	9885va	11630va	11730va
		11765va	11840na	11890va	11900va
		11940va	11995va	12005va	12015va
		12035va	12050va	15185va	15375va
		15480va	15500va	15505va	15525va
		15555va	15560va	17570am	17610am
		17655va	17670va	17765va	17765va
		17775va	17775va	17785va	17810am
		17850va	21475va	21480va	21490va
		21615na	21645na	21690va	21740va
		21790va	21845va		
1600-1700	Radio Nigeria	4990do			
1600-1630 as	Radio Norway	15230me	21730me		
1600-1630	Radio Pakistan	11570me	13665me	15560me	17555af
		17725af	21480me		
1600-1700	Radio RSA, Johannesburg		7230af	15270af	17840af
1600-1700	Radio Tanzania	5985af	9684af	11765af	
1600-1700	Radio Zambia Int'l	9505af	11880af	17895af	
1600-1605	SBC Radio 1, Singapore	5052do	11940do		
1600-1700	SLBS, Sierra Leone	3316do	5980do		
1600-1700	Sri Lanka B'casting Corp.	6075as	9720as		
1600-1700	TWR Swaziland	9600af			
1600-1640	UAE Radio, Dubai	11795af	13675eu	15320eu	15400af
		21605eu			
1600-1610	Vatican Radio	11715as	15090as	17870as	
1600-1630 mtwhf	Vatican Radio	6248eu	7250eu	9645eu	11740eu
		15210eu			
1600-1630	Voice of America	3980eu	7125as	9645as	9700va
		15205va	15260as	15395as	
1600-1700	Voice of America	9575af	11920af	15410af	15580af
		17800af	21625af		
1600-1700 mtwhf	Voice of Kenya	4935do			
1600-1700	Voice of Nigeria	7255af			
1600-1700	Voice of the Somali Peopl	6320do			
1600-1630	Voice of Vietnam	9840eu	12020eu	15010eu	
1600-1700	WHRI Noblesville	15105am	17830am		
1600-1700	WRNO New Orleans	15420			
1600-1700	WWCR Nashville	15690am			
1600-1700	WYFR Okeechobee	11580am	11830am	15355am	17750af
		21525eu	21615af		
1610-1615 mtwhf	Radio Botswana	5955af	7255af		
1615-1700	Swiss Radio Int'l	11955eu			
1630-1700 mwf	Alma Ata Radio	5035do	5915do	6135do	
1630-1700	BBC London	3915as	5975as	6190af	6196eu
		9410eu	9630af	9740me	11750as
		11775na	11940af	12095eu	15070eu
		15260na	15310as	15400af	15420af
		17640va	17695eu	17860af	17880af
		21470af	21660af		
1630-1700	Radio Cairo	15255af			
1630-1700	Radio Canada Int'l	7150as	9555as		
1630-1700 mtwhfa	Radio Netherlands	6020af	15570af		
1630-1700 mtwhf	RTV Morocco	15335af	15360af	17595af	
1630-1700	RTV Rwandiase	3330	6055		
1630-1700	Voice of America	3980eu	6040eu	7125as	9645as
		9700va	11740va	15205va	15245va
		15260as	15395va		

SELECTED PROGRAMS

Sundays

1605 Christian Science Monitor: The Sunday Service. A religious service from the First Church of Christ, Scientist, in Boston.
1610 Voice of America (Africa): Nightline Africa. News and reports on world and African issues.
1610 Voice of America: Encounter. See S 1210.
1615 BBC: Feature. See S 0230.
1640 Voice of America: Words and Their Stories (Special English). See S 0040.
1645 BBC: Letter From America. See S 0545.
1645 Voice of America: People in America (Special English). See S 1345.

Mondays

1606 Christian Science Monitor: News Features. See M 0006.
1610 Voice of America (Africa): Nightline Africa (until 1700). See S 1610.
1610 Voice of America: Focus. See M 1110.
1615 BBC: New Ideas. Innovative developments in technology and new products.
1635 BBC: Talks. "A Small Matter Of Taste" looks at the oxymoronic matter of English cuisine — kippers and cucumber sandwiches (through December 2nd).
1640 Voice of America: Science Report (Special English). See M 0040.
1645 BBC: The World Today. A look at a topical aspect of the international scene.
1645 Voice of America: This is America (Special English). See M 1115.

Tuesdays

1606 Christian Science Monitor: News Features. See M 0006.
1610 Voice of America (Africa): Nightline Africa (until 1700). See S 1610.
1610 Voice of America: Focus. See M 1110.
1615 BBC: Megamix. See T 1130.
1640 Voice of America (Special English): Agriculture Report. See T 1110.
1645 BBC: The World Today. See M 1645.
1645 Voice of America (Special English): Science In the News. See T 1115.

Wednesdays

1606 Christian Science Monitor: News Features. See M 0006.
1610 Voice of America (Africa): Nightline Africa (until 1700). See S 1610.
1610 Voice of America: Focus. See M 1110.
1615 BBC: Rock/Pop Music. See T 0630.
1640 Voice of America: Science Report (Special English). See M 0040.
1645 BBC: The World Today. See M 1645.
1645 Voice of America: Space and Man (Special English). See W 1115.

Thursdays

1606 Christian Science Monitor: News Features. See M 0006.
1610 Voice of America (Africa): Nightline Africa (until 1700). See S 1610.
1610 Voice of America: Focus. See M 1110.
1615 BBC: Network UK. Issues and events affecting people across the UK.
1640 Voice of America: Science Report (Special English). See M 0040.
1645 BBC: The World Today. See M 1645.
1645 Voice of America: The Making of a Nation (Special English). See H 0045.

Fridays

1606 Christian Science Monitor: News Features. See M 0006.
1610 Voice of America (Africa): Nightline Africa (until 1700). See S 1610.
1610 Voice of America: Focus. See M 1110.
1615 BBC: Science In Action. The latest news about scientific innovations.
1640 Voice of America: Science Report (Special English). See M 0040.
1645 BBC: The World Today. See M 1645.
1645 Voice of America: American Mosaic (Special English). See F 1115.

Saturdays

1605 Christian Science Monitor: Herald of Christian Science. See S 0005.
1610 Voice of America (Africa): Nightline Africa. See S 1610.
1610 Voice of America: American Viewpoints. See S 0010.
1615 BBC: Sportsworld. See A 1430.
1640 Voice of America: Words and Their Stories (Special English). See S 0040.
1645 Voice of America: American Stories (Special English). See S 0045.

English language

shortwave guide

1700 UTC [12:00 PM EST/9:00 AM PST]

FREQUENCIES

1700-1730	BBC London	3255af	7160me	15260na	21470af
		21660af			
1700-1730	BBC London	3915as	5975as	6005af	6180eu
		6190af	6195eu	9410eu	9630af
		9740eu	11750as	11775na	12095eu
		15070eu	15310as	15400af	15420af
		17640va	17695eu	17860af	17880af
1700-1800	BBS Bahrain	6010me			
1700-1800	BSKSA Saudi Arabia	9705eu	9720eu		
1700-1800	CFCX Montreal	6005do			
1700-1800	CFRX Toronto	6070do			
1700-1800	CSM World Svc, Boston	11580as	13625as	15665am	17555am
		21640af			
1700-1800	HCJB Quito	21455am	21480am	25950na	
1700-1715	Kol Israel	11587eu	11675na	15590na	17575af
1700-1800	KSDA Guam	13720as			
1700-1800	KTBN Salt Lake City	15590			
1700-1745	R Surinam Intl via Brazil	17835eu			
1700-1800	R. E. Africa, Eq. Guinea	7190af			
1700-1800	Radio 1, Accra, Ghana	4915do			
1700-1705	Radio 2, Accra, Ghana	7295do			
1700-1800	Radio Australia	5995va	6060va	6080va	7240va
		9580va	11910va	12000va	13605va
		13745va	17630va		
1700-1710	Radio Bafoussam, Cameroon		4000do		
1700-1800	Radio Beijing	4130af	9570af	11575af	15225af
1700-1800	Radio Cairo	15255af			
1700-1730	Radio Canada Int'l	7235eu	9555eu	15325eu	17820eu
		21545eu			
1700-1730	Radio Georgia, Tbilisi	12070eu			
1700-1800	Radio Japan	7140as	9505am	11815na	15345me
1700-1800	Radio Moscow	7305va	11630va	11840na	11890va
		11940va	11960va	11995va	12005va
		12015va	12030va	12035va	12050va
		15185va	15375va	15500va	15540va
		17600va	17655va	15500va	15540va
		17600va	17655va	17670va	17710va
		17720va	17775va	17785va	17850va
		21645va	21690va	21740va	21790va
		21845va			
1700-1725	Radio Netherlands	6020af	15570af		
1700-1800	Radio Nigeria	3326do	4990do		
1700-1730 as	Radio Norway	9655eu			
1700-1800	Radio Pakistan	11570eu	15550eu		
1700-1730 mtwhf	Radio Portugal	15425me			
1700-1800	Radio Pyongyang	9325va	9640va	9977va	11760va
1700-1800	Radio RSA, Johannesburg		7230af	15270af	17840af
1700-1800	Radio Tanzania	5985af	9684af	11765af	
1700-1800	Radio Zambia Int'l	9505af	11880af	17895af	
1700-1800 mtwhfa	RTV Morocco	15335af	17595af	17815af	
1700-1728	SLBS, Sierra Leone	3316do	5980do		
1700-1730	Sri Lanka B'casting Corp.		6075as	9720as	
1700-1730	TWR Swaziland	3200af	9520af		
1700-1800	Voice of America	3980va	6040va	7125as	9645as
		9700va	9760va	11760eu	15205va
		15245eu	15260eu	15395as	
1700-1800	Voice of America	9575af	11920af	15410af	15580af
		17800af	21625af		
1700-1800 mtwhf	Voice of Kenya	4935do			
1700-1800	Voice of Nigeria	7255af			
1700-1800	WHRI Noblesville	15105	17830		
1700-1800	WMLK Bethel	9465eu			
1700-1800	WRNO New Orleans	15420			
1700-1800	WWCR Nashville	15690			
1700-1800	WYFR Okeechobee	13760am	21500eu		
1706-1800	*Radio 2, Accra, Ghana*	3366do			
1715-1745	BBC London	9560ca	21660ca		
1715-1730	Radio Buea, Cameroon	3970do			
1728-1800	SLBS, Sierra Leone	3316do			
1730-1800	BBC London	3255af	7160me	21470af	21660af
1730-1800	BBC London	3915as	5975as	6005af	6180eu
		6190af	6195eu	9410eu	9630af
		9740me	11775na	12095eu	15070eu
		15260na	15310as	15400af	15420af
		17640va	17695eu	17660af	17880af
1730-1745	Radio Bayrak, Cyprus	6150va			
1730-1745 a	Radio Douala, Cameroon	4795do			
1730-1800 a	Radio Latvia, Riga	5935eu			
1730-1800	Radio Romania Int'l	11940af	15340af	15365af	17745
		17805			
1730-1800	Radio Tirana	9580eu	11825eu		
1730-1800	TWR Swaziland	3200af			
1730-1800	Vatican Radio	17710af	17730af	21650af	25950
1740-1800	Cameroon Radio-TV	4850do			
1745-1800 mtwhfa	Radio Douala, Cameroon	4795do			
1745-1800	RTV Madagascar	3232do	3286do	5005do	

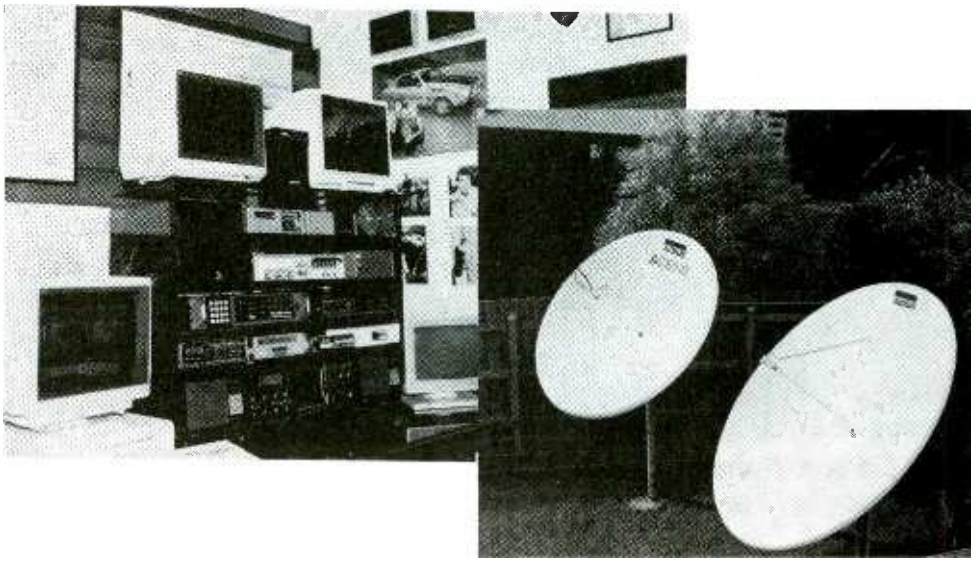
1800 UTC [1:00 PM EST/10:00 AM PST]

FREQUENCIES

1800-1900	All India Radio, Delhi	11935af
1800-1830	BBC London	3255af 3955eu 5975as 6180eu 6190af 6195eu 7160me 7325af 9410eu 9600af 9740me 11750as 12095eu 15070eu 15310as 15400af 17640eu 17880af
1800-1900	BBS Bahrain	6010me
1800-1900	BSKSA Saudi Arabia	9705eu 9720eu
1800-1900	Cameroon Radio-TV	4850do
1800-1900	CFCX Montreal	6005do
1800-1900	CFRX Toronto	6070do
1800-1900	CSM World Svc, Boston	13625as 15665am 17555am 21640af
1800-1830	Georgian Radio, Tbilisi	12070me
1800-1900	KTBN Salt Lake City	15590
1800-1810	Malawi B'casting Corp.	3381do
1800-1900	R. E. Africa, Eq. Guinea	7190af
1800-1900	R. for Peace Int'l	13660 2 21566 2 25945am
1800-1900	Radio 1, Accra, Ghana	4915do
1800-1900	Radio 2, Accra, Ghana	7295do
1800-1900	Radio Australia	5995va 6060va 6080va 7240va 9580va 9860va 11910va
1800-1840 w	Radio Bertoua, Cameroon	4750do
1800-1830	Radio Cairo	15255af
1800-1830	Radio Canada Int'l	13670af 15260af 17820af
1800-1845 mtwhfa	Radio Douala, Cameroon	4795do
1800-1900	Radio Ivory Coast, Abidjn	11920af
1800-1900	Radio Korea	15575eu
1800-1900	Radio Moscow	6065va 11655va 11765va 11840na 11850va 11900va 11995va 12050va 15230va 15330va 15335va 15375va 15415va 15520va 15535va 15540va 15595va 17600va 17655va 17670va 21585va 21740va 21750va 21845va
1800-1900	Radio Mozambique	3265af 4855af 9618af
1800-1900	Radio New Zealand Int'l	15120pa
1800-1900	Radio Nigeria	3326do 4990do
1800-1900	Radio Tanzania	5985af 9684af 11765af
1800-1900	Radio Zambia Int'l	9505af 11880af 17895af
1800-1900	Radiobras, Brasilia	15265eu
1800-1830	RTV Congolaise	3265af 4765af
1800-1900	SLBS, Sierra Leone	3316do
1800-1845	TWR Swaziland	3200af 9600af
1800-1900	VOA Europe	21705eu
1800-1900	Voice of America	3980eu 6040va 9700va 9760va 11760eu 15205eu 15245eu
1800-1900	Voice of America	9575af 11920af 15410af 15580af 17800af 21625af
1800-1900	Voice of Ethiopia	9662af
1800-1900 mtwhf	Voice of Kenya	4935do
1800-1830	Voice of Vietnam	9840eu 12020eu 15010eu
1800-1900	WHRI Noblesville	13760na 15105sa
1800-1900	WMLK Bethel	9465eu
1800-1900	WRNO New Orleans	15420na
1800-1900	WWCR Nashville	15690na
1800-1900	WYFR Okeechobee	21500na
1815-1900	Radio Bangladesh	12030as 15255as
1815-1830	Radio Voice of Lebanon	5me 6549.5
1830-1900	BBC London	3255af 3955eu 6005af 6180eu 6190af 6195eu 7325eu 9410eu 9600af 11750as 12095eu 15070eu 15400af 17880af
1830-1900	Radio Afghanistan	7310eu 9635eu
1830-1900 as	Radio Canada Int'l	15260eu 17820eu
1830-1900	Radio Finland	6120eu 9550eu 11755eu 15185eu
1830-1900	Radio Netherlands	6020af 15570af 17605af 21685af
1830-1900	Radio Sofia, Bulgaria	11660eu 11720eu 11765af 15330eu 17780af 17825af
1830-1900	RAI Vienna	5945eu 6155eu 12010me 13730af
1830-1900	Sri Lanka B'casting Corp.	9720eu 15120eu
1830-1900	Swiss Radio Int'l	9885af 11955af
1840-1850 mtwhfa	R National de Venezuela	9540om
1840-1850	Voice of Greece	11645af 15650af
1845-1900	Ghana B'casting Corp.	6130af
1845-1900	RTV Guinea	4900af 7125af
1845-1900 s	RTV Mali	4783do 4835do 5995do 7285do
1845-1900	TWR Swaziland	3200af

Monitoring Post Pin-Up

Neil Dickery of Melbourne, Australia shows us his shack. It includes an ICOM R-9000 and Infotech M-6000, along with two satellite dishes for monitoring Aussat (Australian satellite) and other L bands.



English language

shortwave guide

1900 UTC [2:00 PM EST/11:00 AM PST]

FREQUENCIES

1900-2000	All India Radio, Delhi	11935af
1900-1930	BBC London	3255af 3955eu 6005af 6180eu 6190af 6195eu 7160me 7325eu 9410eu 9600af 9630af 11750pa 12095eu 15070eu 15400af 17880af
1900-2000	BBS Bahrain	6010me
1900-1930	BRT Brussels	5910eu 9905eu 15515af
1900-2000	BSKSA Saudi Arabia	9705eu 9720eu
1900-1945	Cameroon Radio-TV	4850na
1900-2000	CFCX Montreal	6005do
1900-2000	CFRX Toronto	6070do
1900-2000	CSM World Svc, Boston	13625as 15665am 17555af 21640af
1900-1950	Deutsche Welle	9760af 11785af 11810af 13790af 15350af 15390af 17810af
1900-2000	Ghana B'casting Corp.	6130af
1900-2000	HCJB Quito	15270eu 17790eu 21455eu 21480eu 29590eu
1900-1930	Kol Israel	11587eu 11605eu 11675am 15640af 17575af 17630as
1900-2000	KTBN Salt Lake City	15590
1900-2000	R. E. Africa, Eq. Guinea	7190af
1900-2000	R. for Peace Int'l	13660 2 21566 2 25945am
1900-2000	Radio 1, Accra, Ghana	4915do
1900-2000	Radio 2, Accra, Ghana	7295do
1900-2000	Radio Algiers	9510me 9535me
1900-2000	Radio Australia	5995va 6060va 6080va 7240va 9580va 9860va 11910va 12000va 13605va 13745va
1900-2000	Radio Beijing	9440af 11515af
1900-1930	Radio Canada Int'l	5995eu 7235eu 13650eu 15325eu 17875eu 1675eu
1900-1930 mtwhf	Radio Canada Int'l	13670af 15260af 17820af
1900-2000	Radio Havana Cuba	17705eu
1900-1930	Radio Japan, Tokyo	9505am 9640am 9645au 11850af
1900-2000	Radio Moscow	7305va 11630va 11765va 11840na 11890va 13605va 15185va 15330va 15375va 15540va 15560va 15580va 1555va 17670va 17695va
1900-1925	Radio Netherlands	6020af 15570af 17605af 21685af
1900-2000 smtwhf	Radio New Zealand Int'l	15120pa
1900-2000	Radio Nigeria	3326do 4990do
1900-1930 as	Radio Norway	15220af 17730sa
1900-2000	Radio Sofia, Bulgaria	11660eu 11720eu 11765af 15330eu 17780af 17825af
1900-1915	Radio Tanzania	5985af 9684af 11765af
1900-2000	Radio Zambia Int'l	9505af 11880af 17895af
1900-2000	RAE Buenos Aires	15345eu
1900-2000 s	RTV Morocco	15335af
1900-2000	SLBS, Sierra Leone	3316do
1900-2000	Spanish Foreign Radio	9875eu 11790eu 15375af 15395eu
1900-2000	Sri Lanka B'casting Corp.	9720eu 15120eu
1900-2000	TWR Swaziland	3200af 3240af
1900-2000	VOA Europe	21705
1900-2000	Voice of America	3980eu 6040va 9525as 9700va 9760va 11760va 11870as 15180as 15205va 15245as
1900-2000	Voice of America	9575af 11920af 15410af 15580af 17800af 21625af
1900-2000 mtwhf	Voice of Kenya	4935do
1900-2000	Voice of Nigeria	7255af
1900-1930	Voice of Vietnam	9840eu 12020eu 15010eu
1900-2000	WHRI Noblesville	13760 17830
1900-2000	WMLK Bethel	9465eu
1900-2000	WRNO New Orleans	15420
1900-2000	WWCR Nashville	15690
1900-2000	WYFR Okeechobee	15355af 21615eu
1910-1915	Radio Botswana	3356af
1920-1930	Radio Buea, Cameroon	3970do
1920-1930	Voice of Greece	7430 9395
1930-2000	BBC London	3255af 3955eu 6005af 6180eu 6190af 6195eu 7160me 7325eu 9410eu 9600af 9630af 11750pa 12095eu 15070eu 15400af 17880af
1930-2000 tes	KFBS Saipan	9475af
1930-1940 irr	Radio Burkina Faso	4815af 7230af
1930-2000	Radio Canada Int'l	6170eu 9650eu 9670eu 13650eu 15325eu 17825eu 21675eu
1930-2000	Radio Federal Yugoslavia	6100eu 15140eu
1930-2000	Radio Prague	6055eu 7345eu
1930-2000	Radio Romania Int'l	7145eu 9690eu 9750eu 11940eu
1930-2000	Radio Sweden	6065va 9655va 15270va
1930-2000	VOIRI, Teheran, Iran	6140eu 9022eu
1935-1955	RAI, Rome	7275eu 9710eu 11800eu
1935-1945	RTV Togo	5047af
1940-2000 smwha	Ulaanbaatar R., Mongolia	11850eu 12015eu
1950-2000	Sudan Nat'l B'casting Cor	9540do 9550do 11635do
1950-2000	Vatican Radio	9645va 11625va 15090va

Do you have special QSLs, pennants, or logos from radio stations? Send them to us and we'll use them as space permits. We'll copy them and return them to you within the month. Send them to:

QSLs,
c/o Monitoring Times
P.O. Box 98
Brasstown, NC 28902.

John Carson, Norman, OK submits this QSL from Voice of Free China.

2000 UTC [3:00 PM EST/12:00 PM PST]

FREQUENCIES

2000-2030	BBC London	3255af 3955eu 5975eu 6005af 6180eu 6190af 6195eu 7160me 7180pa 7325eu 9410eu 9600as 9630af 11750pa 12095eu 15070eu 15260sa 15340pa 15400af 17880af
2000-2100	BBS Bahrain	6010me
2000-2100	BSKSA Saudi Arabia	9705eu 9720eu
2000-2100	CFCX Montreal	6005do
2000-2100	CFRX Toronto	6070do
2000-2100	CSM World Svc, Boston	9455as 13625pa 13770am 15665eu 17555eu
2000-2100	Georgian Radio, Tbilisi	12015me
2000-2100 tes	KFBS Saipan	9475af
2000-2100	King of Hope, Lebanon	6280me
2000-2100	KTBN Salt Lake City	15590
2000-2100	KVOH Los Angeles	17775am
2000-2010 w	Malawi B'casting Corp.	3381do
2000-2100	R. E. Africa, Eq. Guinea	7190af
2000-2100	R. for Peace Int'l	7375na 13630na 15030na 21465na
2000-2100	Radio 1, Accra, Ghana	4915do
2000-2100	Radio 2 Accra, Ghana	7295do
2000-2100	Radio Australia	5995va 6060va 6080va 7240va 9860va 11930va 12000va 13605va 13745va 17795va
2000-2100	Radio Beijing	4130eu 9920eu 11500eu
2000-2100	Radio Beijing	9440af 11715af 15110af
2000-2030	Radio Georgia, Tbilisi	11760eu
2000-2100	Radio Havana Cuba	17705eu
2000-2100	Radio Moscow	1143eu 6000va 7330va 11520va 11630va 11765va 11840na 11890va 11960va 12050va 12060va 13605va 15185va 15330va 15500va 15540va 15560va 15580va 15595va 17695va 21740va
2000-2100 smtwhf	Radio New Zealand Int'l	15120pa
2000-2100	Radio Nigeria	3326do 4990do
2000-2100	Radio Polonia, Warsaw	6135eu 7270eu 9525eu
2000-2030 mtwhf	Radio Portugal	11740eu
2000-2100	Radio Pyongyang	9345va 9640va 9977va
2000-2030	Radio Romania Int'l	7145eu 9690eu 9750eu 11940eu
2000-2030	Radio Sweden	6065va 9655va 15270va
2000-2100 s	Radio Zambia Int'l	9505af 11880af 17895af
2000-2100	SLBS, Sierra Leone	3316do
2000-2030	Swiss Radio Int'l	3985eu 6165eu 9535eu
2000-2100	TWR Swaziland	3200af 3240af
2000-2010 smwha	Ulaanbaatar R., Mongolia	11850eu 12015eu
2000-2100	Voice of America	3980eu 6040va 9700va 9760va 11760va 15205va 15245va
2000-2100	Voice of America	9570af 15410af 15580af 17800af 21485af 21625af
2000-2100	Voice of Indonesia	7125as 9675as 11752as 11785as
2000-2010 mtwhf	Voice of Kenya	4935do
2000-2030	Voice of Nigeria	7255af
2000-2030	VOIRI, Teheran, Iran	6140eu 9022eu
2000-2100	WHRI Noblesville	13760af 15105sa
2000-2100	WRNO New Orleans	15420
2000-2100	WWCR Nashville	15690
2000-2100	WYFR Okeechobee	15566eu 17612af 21525eu 21615eu
2005-2100	Radio Damascus	12085na 15095na
2010-2100 sa	Voice of Kenya	4935do
2015-2030	V. de la Rev., Benin	4870af 5025af
2015-2045 sth	V. of the Black Cockerel	9700af
2020-2030 mtwhfa	Voice of Greece	9395eu 11645eu
2025-2045	RAI, Rome	7235me 9575me 11800me
2030-2100	BBC London	3255af 3955eu 5975ca 6005af 6180eu 6190af 6195eu 7180pa 7325eu 9410eu 11750pa 12095eu 15070eu 15260sa 15340pa 15400af
2030-2100	Radio Cairo	15375af
2030-2100	Radio Korea	6480eu 7550af 15575eu
2030-2100	Radio Netherlands	7285af 9860af 9895af 11660af 13700af
2030-2100	Radio Tallin, Estonia	5925eu 9560eu
2030-2100	Voice of Vietnam	9840eu 12020eu 15010eu
2045-2100	All India Radio, Delhi	7412eu 9665eu 9910eu 11620eu 11715eu 15265eu
2045-2100	Radio Sofia, Bulgaria	11765eu 17780af 17825af
2050-2100	Vatican Radio	6248eu 7250eu

On location at the RNZI transmitter site at Rangataiki, 4 kms west of Taupo-the RNZI staff from Wellington together with members of the Maori and Pacific Islands broadcasting unit from Auckland.

2100 UTC [4:00 PM EST/1:00 PM PST]

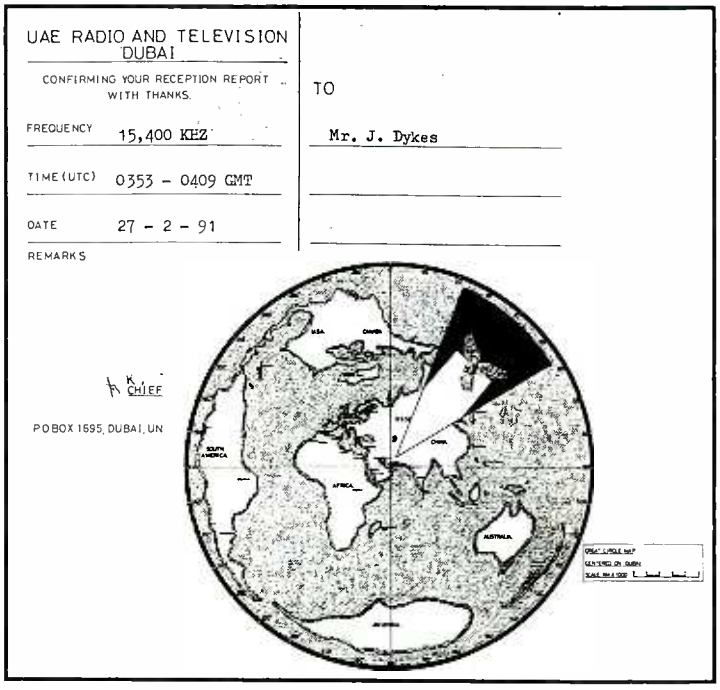
FREQUENCIES

2100-2130	BBC London	6195as	5975ca	6005af	3255af
		3955eu	6180eu	15340pa	11750pa
		12095eu	15070na	15260sa	15400af
		9590na	9410eu	7325eu	
2100-2106	BBS Bahrain	6010me			
2100-2200	CFCX Montreal	6005do			
2100-2200	CFRX Toronto	6070do			
2100-2200	CSM World Svc, Boston	9455as	13625pa	13770am	15610eu
		15665eu	17555sa		
2100-2150	Deutsche Welle	9760as	9765as	11785as	13780as
		15350as	15360as		
2100-2130	Georgian Radio, Tbilisi	11760eu			
2100-2130	King of Hope, Lebanon	6280me			
2100-2200	KTBN Salt Lake City	15590			
2100-2200	KVOH Los Angeles	17775			
2100-2110	Malawi B'casting Corp.	3381do			
2100-2200	R. E. Africa, Eq. Guinea	7190af			
2100-2200	R. for Peace Int'l	7375na	13630na	15030na	21465na
2100-2200	R. Nacional de Angola	3355af	9535af		
2100-2200	Radio 1, Accra, Ghana	4915do			
2100-2200	Radio 2, Accra, Ghana	7295do			
2100-2200	Radio Australia	6060va	11880va	11930va	13705va
		15160va	15240va	15320va	17715va
		17795va	21740va		
2100-2200	Radio Beijing	4130eu	9920eu	11500eu	3985eu
2100-2200	Radio Cairo	15375af			
2100-2130	Radio Canada Int'l	5995eu	7235eu	13650eu	
2100-2200	Radio Canada Int'l	15325eu	17875eu		
2100-2105	Radio Damascus	12085na	15095na		
2100-2200	Radio Japan	11815me	11840eu	15430eu	17810as
		17890as			
2100-2130	Radio Korea	6480eu	7550af	15575eu	
2100-2200	Radio Moscow	1143eu	1494eu	7300va	7330va
		9740va	9800va	11520va	11630va
		11675va	11685va	11745va	11840na
		11850va	11890va	12050va	12060va
		15130va	15355va	15385va	15455va
		15500va	15535va	15560va	15580va
		15595va	17655va	17735va	21565va
		21630va			
2100-2125	Radio Netherlands	7285af	9860af	9895af	11660af
		13700af			
2100-2200	Radio New Zealand Int'l	15120pa			
2100-2200	Radio Nigeria	3326do	4990do		
2100-2130 as	Radio Norway	9590eu	17750pa		
2100-2130 mtwhf	Radio Portugal	15250eu			
2100-2130	Radio Prague	5930eu	6055eu	7345eu	9605eu
2100-2130	Radio Romania Int'l	7145eu	9690eu	9750eu	11810eu
		11940eu			
2100-2130	Radio Sofia, Bulgaria	11765eu	17780af	17825af	
2100-2200	Radio Zambia Int'l	9505af	11880af	17895af	
2100-2200	SLBS, Sierra Leone	3316do			
2100-2200	Spanish Foreign Radio	9875af			
2100-2200	Sri Lanka B'casting Corp.	15120as			
2100-2130	Swiss Radio Int'l	3985eu	6165eu	9535eu	9885eu
2100-2130	Swiss Radio Int'l	12035af	13635af	15525af	
2100-2115	TWR Swaziland	3240af			
2100-2110	Vatican Radio	6248eu	7250eu		
2100-2130	Vatican Radio	17710af	17730af	21650af	
2100-2200	Voice of America	3980eu	6040va	9700va	9760va
		11760va	11870as	11960va	15185as
		15205va	15245as	17735as	
2100-2200	Voice of America	15410af	15580af	17800af	21485af
		21625af			
2100-2200	Voice of Turkey	9445eu			
2100-2200	WHRI Noblesville	13760	17830		
2100-2200	WRNO New Orleans	15420			
2100-2200	WWCR Nashville	15690			
2100-2200	WYFR Okeechobee	15566af	17612af	21525eu	21615eu
2110-2200	Radio Damascus	12085na	15095na		
2115-2130 mtwhf	BBC London Caribbean Rpt.		17715ca		
2115-2130 s	R. Republik Indonesia	6070do			
2115-2200	Radio Cairo	9900eu			
2130-2200	Alma Ata R., Khazakhstan		3955as	4400as	5035as
		5260as	5960as	5970as	9505as
		15215as	15315as	15385as	17605as
		17715as	17730as		
2130-2200	BBC London	3255af	3955eu	5975ca	6005af
		6180eu	6195as	7325eu	9410eu
		9590na	11750pa	12095eu	15070na
		15260sa	15340pa	15400af	
2130-2200	BBC London Falkland Is Sv		13660sa		
2130-2200	HCJB Quito	17790eu	21455eu	21480eu	25950eu
2130-2200 smtwhf	King of Hope, Lebanon	6280me			
2130-2200	Kol Israel	9435na	11587na	11605na	15100eu
		15640eu	17575sa		
2130-2145	Radio Buea, Cameroon	3970do			
2130-2200	Radio Canada Int'l	11880af	15150af	17820af	
2130-2200	Radio Finland	6120eu	11755eu		
2130-2200	Radio Sweden	6065eu			
2130-2200	RAI Vienna	5945eu	6155eu	12010me	13730af
2140-2150 mtwhfa	R Nacional de Venezuela	9540			
2145-2200	Cameroon Radio-TV	4850na			

2200 UTC [5:00 PM EST/2:00 PM PST]

FREQUENCIES

2200-2230	All India Radio, Delhi	7412eu	9665eu	9910eu	11620eu
		11715eu	15265eu		
2200-2300	BBC London	5975na	6195as	9410eu	9570pa
		9590na	9915ca	11750sa	11945as
		11955as	12095na	15070na	15260sa
		15340as	15400af	17830as	
2200-2230	BRT Brussels	5910eu	9905eu	15515af	
2200-2215	Cameroon Radio-TV	4850na			
2200-2300	CFCX Montreal	6005do			
2200-2300	CFRX Toronto	6070do			
2200-2300	CSM World Svc, Boston	9465na	13625as	13770af	15405as
		17555af			
2200-2230	Georgian Radio, Tbilisi	11760eu			
2200-2230 s	KGEI San Fransisco	15280sa			
2200-2300	KTBN Salt Lake City	15590			
2200-2300 sa	R. E. Africa, Eq. Guinea	7190af			
2200-2300	R. for Peace Int'l	13630ca	21465ca	15030am	
2200-2300	Radio 1, Accra, Ghana	4915do			
2200-2300	Radio 2, Accra, Ghana	7295do			
2200-2300	Radio Australia	11880va	11930va	13705va	15160va
		15240va	15320va	17715va	17795va
		21740va			
2200-2210	Radio Bafoussam, Cameroon	4000do			
2200-2300	Radio Beijing	11990eu			
2200-2300	Radio Budapest	6110eu	9835eu	11910eu	
2200-2245	Radio Cairo	9900eu			
2200-2230	Radio Canada Int'l	5960na	9755na	11905as	13670ca
2200-2210	Radio Damascus	12085na	15095na		
2200-2245	Radio Federal Yugoslavia	6100na	15140na		
2200-2300	Radio Havana Cuba	7215eu			
2200-2300	Radio Kiev	5960eu			
2200-2300	Radio Moscow	11985va	12050va	12060va	15355va
		15425va	15560va	15580va	15595va
		17605eu	17655va	17720va	17750va
		17840va	21690va		
2200-2300	Radio New Zealand Int'l	17770pa			
2200-2300	Radio Nigeria	3326do	4990do		
2200-2300	Radio Polonia, Warsaw	5995eu	6135eu	7270eu	
2200-2230	Radio Prague	5930eu	6055eu	7345eu	9605eu
2200-2230 a	Radio Republik Indonesia	3385do	4805do		
2200-2230	Radio Sweden	6065va			
2200-2230	Radio Tirana	9580eu	11825eu		
2200-2215	Radio Zambia Int'l	9505af	11880af	17895af	
2200-2225	RAI, Rome	5990as	9710as	11800as	
2200-2300 smtwha	RTM Malaysia	7295do			
2200-2218	RTV Congolaise	4765do	5985do		
2200-2300	SBC Radio 1, Singapore	5010do	5052do	11940do	
2200-2300	SLBS, Sierra Leone	3316do			
2200-2300	UAE Radio Abu Dhabi	9600na	11965na	13605na	
2200-2300	V. of Free China, Taiwan	17750eu	21720eu		
2200-2300	Voice of America	6095as	7120va	9770as	11760as
		15185va	15215va	15255as	15290as
		15305va	17735as	17810as	17820as
		17885va			
2200-2300	WHRI Noblesville	13760na	17830sa		
2200-2300	WRNO New Orleans	13720na			
2200-2300	WWCR Nashville	15690na			
2200-2300	WYFR Okeechobee	17612af	21525eu		
2205-2300	Vatican Radio	7125as	9615as	11830as	
2230-2300 mtwhf	RTV Congolaise	4765do			
2230-2300	Swiss Radio Int'l	6190eu			
2240-2225	Voice of Greece	11645am			
2245-2300	Radio Sofia, Bulgaria	11660eu	11710na	15110eu	15330na
		15370eu	17825na		



Both of these QSLs were received by John Dykes, Hopkins, SC in less than 60 days!

English language

shortwave guide

2300 UTC [6:00 PM EST/3:00 PM PST]

FREQUENCIES

2300-0000	AWR Costa Rica	9725ca	11825ca		
2300-2330	BBC London	5975na	6175na	6195as	7145as
		9410eu	9570pa	9590na	9915sa
		11750sa	11945as	11955as	12095na
		15070na	15260sa	15340pa	15400af
2300-0000	CFCX Montreal	6005na			
2300-0000	CFRX Toronto	6070do			
2300-0000	CSM World Svc, Boston	9465na	13625as	15405af	13770as
		17555af			
2300-0000	KSDA Guam	15610as			
2300-0000	KTBN Salt Lake City	15590na			
2300-0000	R. for Peace Int'l	7375na	13630na	15030na	21465na
2300-2305	Radio 1, Accra, Ghana	4915do			
2300-2305	Radio 2, Accra, Ghana	7295do			
2300-0000	Radio Australia	11880va	11930va	13605va	15160va
		15240va	15320va	17715va	17795va
		21740va			
2300-2330	Radio Canada Int'l	9755na	11730ca	13670na	11940ca
		15235sa			
2300-0000	Radio Japan	11735eu	11815am	15195as	15430am
		17810pa			
2300-0000	Radio Moscow NAS	11690na	11710na	11780na	11985na
		12050na	13605na	15140na	15355na
		15425na	15480na	15550na	15560na
		15580na	15590na	15595na	16190na
		17655na	17735na	17850na	17890na
2300-0000	Radio Moscow NAS	21690na			
2300-0000	Radio New Zealand Int'l	17770pa			
2300-2330 as	Radio Norway	11925na			
2300-0000	Radio Orion, South Africa	4810af			
2300-0000	Radio Pyongyang	11700na	13650na		
2300-0000	Radio Sofia, Bulgaria	11660eu	11710na	15110eu	15330na
		15370eu	17825na		
2300-0000	Radio Thailand	4830as	9655as	11905as	
2300-0000 smtwha	RTM Malaysia	7295do			
2300-0000	SBC Radio 1, Singapore	5010do	5052do	11940do	
2300-0000	SLBS, Sierra Leone	3316do			
2300-0000	UAE Radio Abu Dhabi	9600na	11965na	13605na	
2300-2330	Vatican Radio	6185eu			
2300-0000	Voice of America	7120as	9530va	9770as	11760as
		11905va	11960va	15185as	15225va
		15290as	15305as	15445va	17735as
		17820as	17885va		
2300-0000	Voice of Turkey	7225eu	9445na	9685eu	17880as
2300-0000	WHRI Noblesville	9495na	13760sa		
2300-0000	WRNO New Orleans	13720na			
2300-0000	WWCR Nashville	15690na			
2300-0000	WYFR Okeechobee	5985na	11915na		
2315-0000	All India Radio, Delhi	9535as	9910as	11715as	11745as
		15110as			
2330-0000	BBC London	5975na	6175na	6195as	7145as
		9570pa	9590na	9915sa	11750sa
		11945as	11955as	12095na	15070na
		15260sa	17830as		
2330-0000	Radio Canada Int'l	5960na	9755na	13670na	
2330-0000	Radio Sweden	9695ca	11705ca		
2330-0000	Voice of Vietnam	9840as	12020as	15010as	

SELECTED PROGRAMS

Sundays

2305 BBC: World Business Review. See S 0530.
2310 Voice of America: Newsline. News, correspondent reports, interviews, and opinion.
2315 BBC: Letter From America. See S 0545.
2330 BBC: Feature. See S 1401.
2330 Voice of America: VOA Morning. See S 0010.

Mondays

2305 BBC: World Business Report. The latest news from the markets worldwide.
2306 Christian Science Monitor: Monitor Radio Worldwide. See M 0106.
2310 Voice of America: Newsline. See S 2310.
2315 BBC: Talks. "Mediawatch" samples the media and communications field (through December 30th).
2330 BBC: Multitrack 1: Top 20. Tim Smith presents the smash singles on the UK pop music charts.
2330 Voice of America: VOA Morning. See S 0010.
2334 Christian Science Monitor: Letterbox. See M 0134.
2348 Christian Science Monitor: Religious Article. See M 0148.

Tuesdays

2305 BBC: World Business Report. See M 2305.
2306 Christian Science Monitor: Monitor Radio Worldwide. See M 0106.
2310 Voice of America: Newsline. See S 2310.
2315 BBC: Concert Hall. See S 1515.
2330 Voice of America: VOA Morning. See S 0010.
2334 Christian Science Monitor: Letterbox. See M 0134.
2348 Christian Science Monitor: Religious Article. See M 0148.

Wednesdays

2305 BBC: World Business Report. See M 2305.
2306 Christian Science Monitor: Monitor Radio Worldwide. See M 0106.
2310 Voice of America: Newsline. See S 2310.
2315 BBC: Good Books. See W 1445.
2330 BBC: Multitrack 2. Graham Bannerman presents new pop records, interviews, news, and contests.
2330 Voice of America: VOA Morning. See S 0010.
2334 Christian Science Monitor: Letterbox. See M 0134.
2348 Christian Science Monitor: Religious Article. See M 0148.

Thursdays

2305 BBC: World Business Report. See M 2305.
2306 Christian Science Monitor: Monitor Radio Worldwide. See M 0106.
2310 Voice of America: Newsline. See S 2310.
2315 BBC: Music Review. News and views from the world of classical music.
2330 Voice of America: VOA Morning. See S 0010.
2334 Christian Science Monitor: Letterbox. See M 0134.
2348 Christian Science Monitor: Religious Article. See M 0148.

Fridays

2305 BBC: World Business Report. See M 2305.
2306 Christian Science Monitor: Monitor Radio Worldwide. See M 0106.
2310 Voice of America: VOA Morning. See S 0010.
2315 BBC: Worldbrief. A roundup of the week's news headlines and developments.
2330 BBC: Multitrack 3. News and releases from the British alternative music scene.
2334 Christian Science Monitor: Letterbox. See M 0134.
2348 Christian Science Monitor: Religious Article. See M 0148.

Saturdays

2305 BBC: Words Of Faith. See S 0540.
2305 Christian Science Monitor: Herald of Christian Science. See S 0005.
2310 BBC: Book Choice. See H 0140.
2310 Voice of America: Newsline. See S 2310.
2315 BBC: A Jolly Good Show. See T 1515.
2330 Voice of America: VOA Morning. See S 0010.

David Gibson and Philippa Hitchen discuss program material for "Vatican Viewpoint". The program airs on Vatican Radio's English Service.

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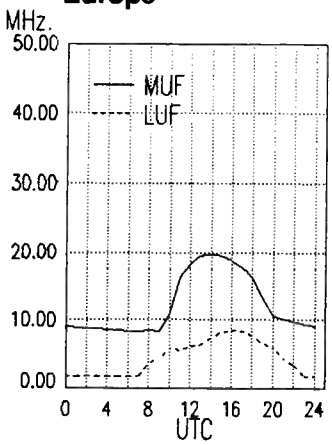
How to use the propagation charts

Propagation charts can be an invaluable aid to the DXer in determining which frequencies are likely to be open at a given time. To use the propagation charts, choose those for your location.

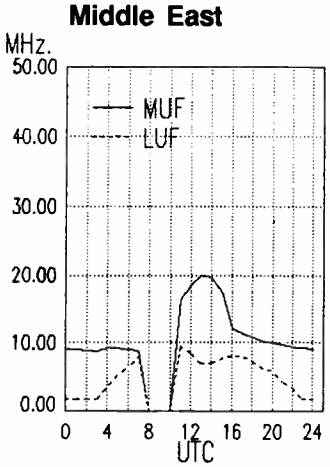
Then look for the one most closely describing the geographic location of the station you want to hear.

Conditions for areas EAST of the Mississippi and ...

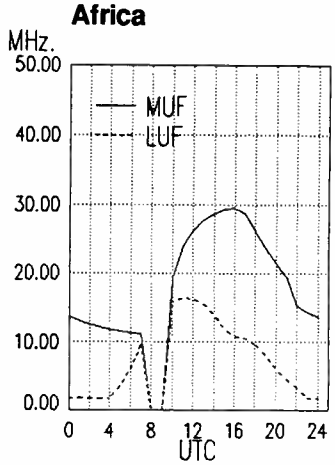
Europe



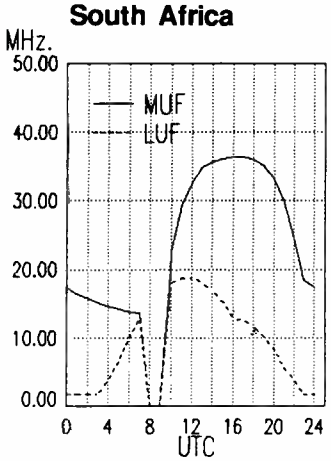
Middle East



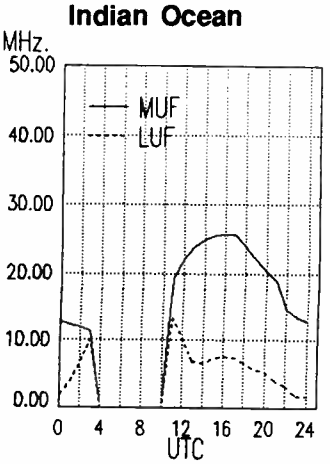
Africa



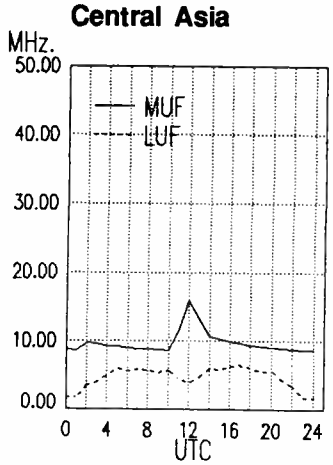
South Africa



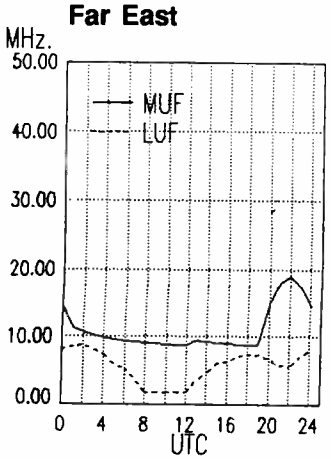
Indian Ocean



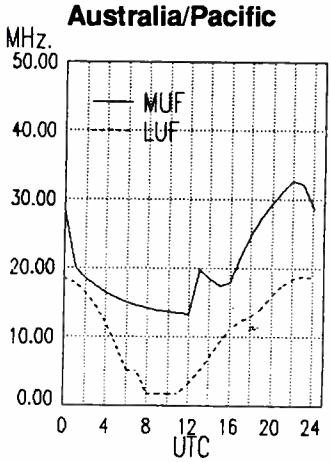
Central Asia



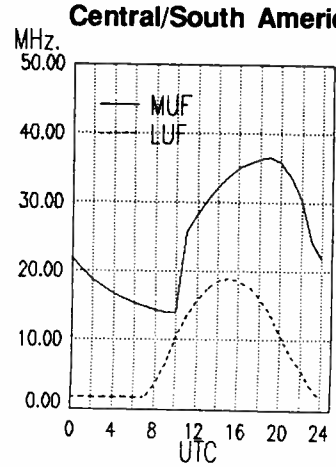
Far East



Australia/Pacific



Central/South America

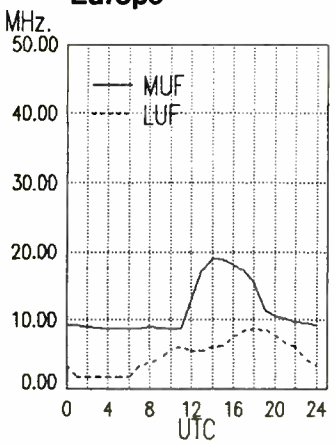


Once you've located the correct charts, look along the horizontal axis of the graph for the time that you are listening. The top line of the graph shows the Maximum Usable Frequency (MUF) and the lower line the Lowest Usable Frequency (LUF) as indicated on the vertical axis of the graph. The strongest signals will be near the MUF.

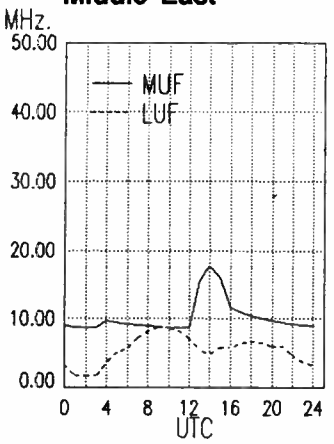
While there are exceptions to every rule (especially those regarding shortwave listening), you should find the charts helpful in determining the best times to listen for particular regions of the world. Good Luck!

Conditions for areas WEST of the Mississippi and ...

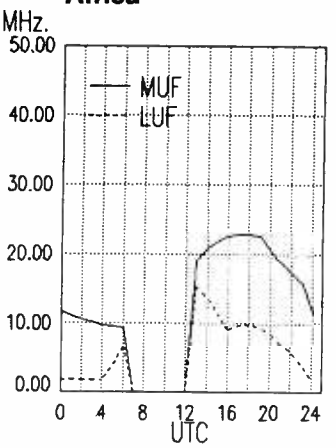
Europe



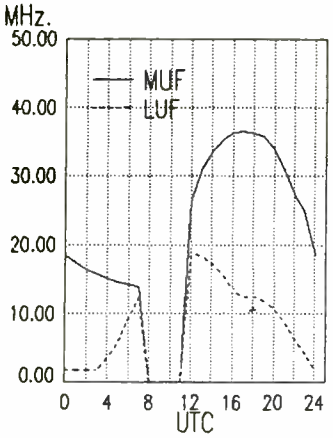
Middle East



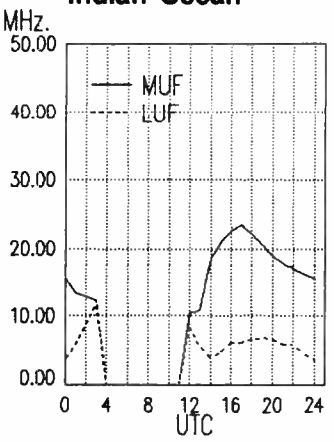
Africa



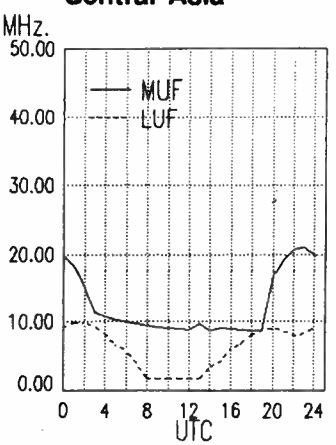
South Africa



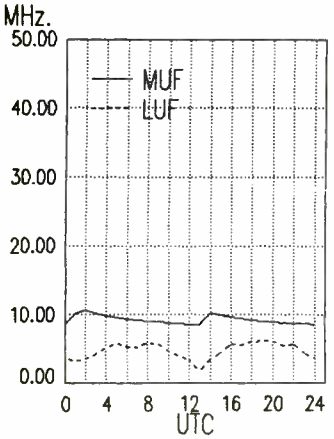
Indian Ocean



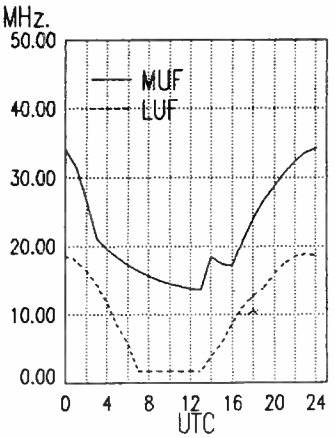
Central Asia



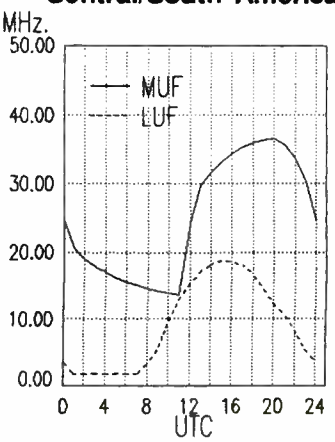
Far East



Australia/Pacific



Central/South America



Lawrence Magne
Editor-in-Chief
Passport to World Band Radio

Magnavox/Philips AE3205

Magnavox' new Chinese-made $49.95 AE 3205, sold outside the United States as the Philips AE 3205, is standard stuff: low cost, low tech, low performance. For everyday listening, these little cheapies don't hack it. But if you're headed for the outdoors or on a worldwide trip, they're fine for tuning in the biggies without worrying about whether your radio will get ruined or stolen.

Thing is, $50 these days can buy a respectable, if uninspiring, radio. The '3205, new though it may be, is really a ghost from Christmases past—scarcely a lively competitor in today's marketplace.

Shortwave Coverage Limits What Can Be Heard

Take shortwave coverage. It's roughly 5900-6250, 7060-7400, 9470-9950, 11600-12100, 15075-15640 and 17550-18200 kHz. For a $50 radio, that's more or less acceptable -- but you'll miss the entire 22 and 13 meter bands (13600-13800 and 21450-21850 kHz), plus some other bits. One cannot help but wonder why so many Chinese-made radios omit coverage of the important 22 meter band, which is also not used for broadcasting by any Chinese-based transmitters. This is one of the most important bands on the air, and unlike 13 meters, lies smack in the middle of the radio's existing frequency coverage.

The '3205 also covers FM, plus AM up to around 1620 kHz, so it misses the upper eight channels of the forthcoming expanded AM band in the Americas. However, international travelers will appreciate that it receives longwave broadcasts.

Imprecise Analog Dial Makes Tuning Difficult

The '3205 is a bandspreaded analog model, as are most—but no longer all—sets in this price category. Its dial is off by as much as +/-40 kHz, which means you have to hunt and peck over a range as wide as 80 kHz to find a desired station. That's annoying. Signal strength is given by a nigh-useless single-LED "glow light."

Poor Performance Limits Usefulness

This is no DX rig. Sensitivity is adequate for listening to the big broadcasters, but not much more. Selectivity is poor, with powerful signals 10 kHz away sometimes bothering the station you're trying to hear. As with virtually all inexpensive models, the '3205 is single-conversion, which means that CW and other interference from "images" is a real pain. Audio quality is only fair.

The telescopic antenna swivels, but doesn't rotate. This means the radio can't be laid on its back with the antenna vertical—the proper position for listening to world band and, to a certain extent, FM stations. It also makes the antenna more susceptible to breakage.

After the '3205's 90-day warranty has expired, the radio is replaced, not repaired, "by a renewed product which meets Philips' high quality standards." Presumably that means you swap your broken unit for a rebuilt one which may or may not be the same model.

Too Little, Too Late, Too Costly

The C.E.O. of another large electronics firm once said that if you don't have a reason to compete, don't compete. He was right, which is why this radio from Philips/Magnavox should never have been brought on the market: it's too little, too late, too costly, and offers nothing to make it stand out. The Pomtrex, also made in China, is just a tad better, but sells for only $30—price makes this one stand out. For the '3205's same $50, there's the DAK MR-101s that is digitally tuned—ease of tuning distinguishes this unit. Either of these makes more sense than the ho-hum AE3205.

A Winning Accessory: The Zero Surge

On To the Good News

You've dug deep into your Levis, handed over a kilobuck minus a cigar in change, and finally purchased your beloved new communications receiver. It's big, it's black, it's magnificent. You wonder how you could have lived without it, until your spouse files for divorce on grounds of neglect.

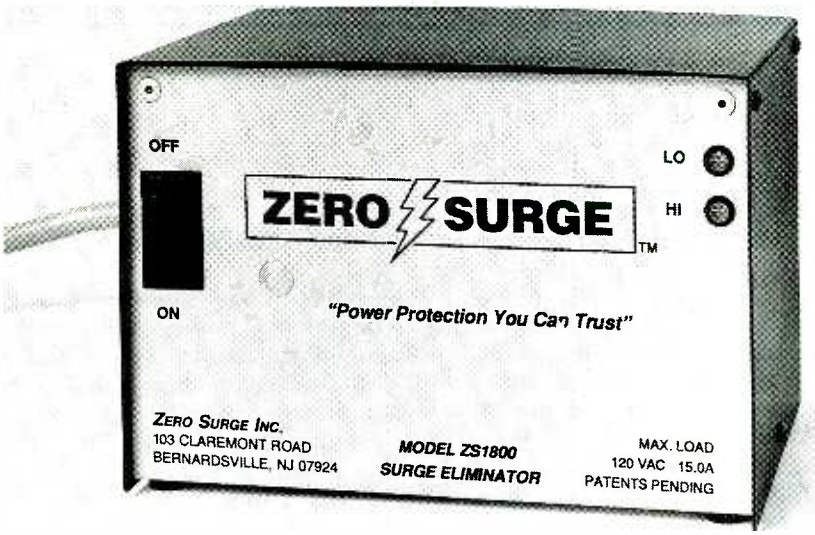
But one morning, it's dead. You shake it, stroke it, dial 911—to no avail. Inside, those wonderful do-all chips have been reduced to atomic cinders. It's off to the repair shop...and, after a month's wait, a $300 invoice. Your black beauty now works, but it will never again purr so nicely as before.

Surges Damage Radios

This may not have happened to you yet, but it has to the *Passport* office on more than one occasion—we're not talking high-flown theories here. Yes, we've used Alpha Delta lightning arresters on our antennas, and they work just great. But even though we have been using many different types of conventional surge protectors, nearly every year at least one item of equipment has been damaged by surges coming in over the power lines.

Lightning is sneaky stuff. It winnows its way into power lines like squirrels into attics. A bolt strikes a block away, you think you're safe—but your set gets zapped, anyway.

Computer folks, mindful of their investment



in hardware and data, have swarmed to surge arresters for years to avoid this scenario. Problem is, those $50 arresters don't do much, and their protective MOVs wear down over time.

Enter Zero Surge (Zero Surge Eliminators, 103 Claremont Rd., Bernardsville NJ 07924; fax 908/766-4144). It's a completely different concept that, instead of trying to channel excess current off immediately to ground, "stores" it, then bleeds it off slowly to neutral. Too, its circuitry does not weaken over time.

Okay, we've all heard this sort of technobabble about which way the electrons flow. Who cares? We just wanted to know if it worked. So, in late 1990 we purchased a Zero Surge and tested it mercilessly for nearly a year.

Surprise—it really works!

Voltage measurements over this test period, a sudden end to equipment failures, and a healthy reduction in computer glitches show the Zero Surge to be in a league unto itself. It's effective with radios, active antennas, computers (including LANs and modems), fax machines, you name it.

Indeed, we found the results so impressive that we have since purchased five more to protect the rest of our receivers, recorders, computers, telephone system and other critical radio and office equipment.

Ten-Year Warranty...and More

Also in a league unto itself is the warranty: 10 years, with any repairs thereafter being guaranteed to cost no more than 20% of the purchase price.

What does that mean in the real world?

Try this. One of our new units turned out to have an intermittent connection in the power cord. We contacted the factory, and that same day they sent a replacement unit and pre-addressed sticky label so we could return the defective unit. They even offered to pay return shipping! All this, they say, is their standard warranty policy. I think the last time I encountered that sort of TLC was in a dream.

A Nail in Time Saves Thine

One technical footnote: The inductive device inside the Zero Surge is made from ordinary finishing nails. I interviewed Wendell Laidley, the company's president to find out why this is so, especially as the rest of the unit looks as if it's designed and built to the highest possible standard.

As he relates it, they experimented with all manner of ferrous alternatives, but the gauss and other characteristics of a fistful of finishing nails proved to be superior. It's reminiscent of Radio West, which when designing their AM antenna—still the best ferrite AM antenna around—found that bunching together small ferrite antenna rods produced better results than did one large ferrite mass.

Drawbacks? Aside from price, all we could find is that the Zero Surge's powerful magnetic field can cause video images to wriggle. Turning the Zero Surge 90° or moving it a couple of feet away from the screen clears things up. Too, it would be nice if the unit would turn back on only after a few seconds' time delay. Electromechanical devices, such as hard disks and refrigerant appliances, can be damaged if the electricity goes off for just a second or so, then suddenly comes back on.

The Bottom Line: Go for It

If surge current matters to you, go for it. The model ZS900, good for 900 watts, is $149; the ZS1800, 1800 watts, $199. The cheaper model is more than adequate to protect a desk full of radio equipment—receiver, recorder, antenna amplifying gear, RTTY gear and the like.

Bob Grove, WA4PYQ

Icom R-1

It's tiny. It's cute. And it works. How well? Well...

In the 1950s, Remington Rand's Univac, a marvel of analog computer design, occupied an entire floor of Cleveland's Terminal Tower. I remember the forest of 6SN7 triodes that were constantly being replaced. Now, nearly any laptop would outperform the Univac's greatest expectations. That's progress.

Over a year ago, ICOM America revealed three new receivers, one of them a tiny pocket scanner. Was the R1 worth the wait? Yes...and no.

The R1 is truly a marvel of miniaturization; an adult hand can nearly encapsulate it. But miniaturization comes with a price, both in dollars and sense; our fingers are so big and our eyes can read only so small.

Audio quality is reasonably good for its diminutive speaker, but volume is best suited to a quiet environment. The teensy keys are bordered by protective panel ridges, making them difficult to press. Panel legends are hard to read.

But the good news mechanically is that the R1 has the substantial, professional look and feel traditional with the Icom line, a leader in quality packaging. Some other radios look like they were extruded in an amusement park arcade; the R1 has the grip of a hand grenade!

The Good News

Frequency coverage is an enormous 100 kHz through 1300 MHz with no gaps, with

SCANNER SPECIFICATIONS AT A GLANCE

ICOM R-1

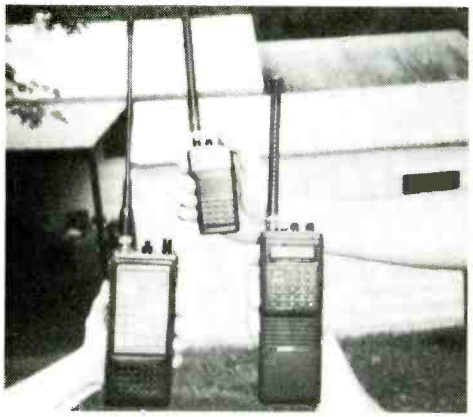
Frequency range: 100 kHz-1300 MHz
Keypad frequency entry: Yes
Tuning steps: 0.5/5/8/9/10/12.5/15/20/25/30/50 kHz
RIT (fine tuning): Tuning knob
Display: Edge-lit LCD, 4 decimal places
Dimmer: On/Off
Type of listening recommended: Domestic & international broadcasting, including FM and TV audio; VHF/UHF scanning
Receiving modes: AM, narrowband FM, wideband FM
Memory: 100 channels
Scan: 20 channels/second
Banks: 10
Lockout: Yes
Priority: Yes
Search: 10 ranges with autoload
Delay: 2 second, 10 second timed
Squelch: All modes
Clock: With on/off timer
Audio output power: 150 milliwatts @ 8 ohms
Record audio output: Earphone jack
S meter: LCD bargraph
Computer interface: No
Conversion scheme: Trip conversion 266.7/10.7 MHz/455 kHz
Sensitivity: NFM, 0.4 uV; AM, 079 uV, WFM 3.2 uV
Selectable preamplifier: No
Selectable attenuator: No
Selectivity: (-6dB) AM 15 kHz; narrow FM 15 kHz; wide FM 150 kHz
Image rejection: Not available
Frequency stability: Not available
Selectable AGC: No
Dynamic range: Not available
Passband tuning: No
Noise blanker/limiter: No
Adjustable notch filter: No
Tone control: No
Antenna connector: BNC
Auxiliary connector: No
Dimensions: 1-7/8"W x 4"H x 1-1/2"D
Weight: 9.9 ounces
Power requirements: Internal nicads; 120 VAC wall charger/adaptor included; 6-16 VDC external
Warranty: One year
Accessories included: Flex antenna, AC wall adaptor/charger, belt clip

Uniden BC 200XLT

Frequency range: 29-54, 118-174, 406-512, 806-956 MHz (less cellular)
Keypad frequency entry: Yes
Tuning steps: 5/12.5 kHz determined by frequency range
RIT (fine tuning): No
Display: Edgelit LCD
Dimmer: On/Off
Type of listening recommended: VHF/UHF utilities
Receiving modes: AM/narrow FM determined by frequency range
Memory: 200 channels
Scan: 16 channels per second
Banks: 10
Lockout: Yes
Priority: Ten channels
Search: Yes
Delay: Individual channels
Squelch: Yes
Clock: No
Audio output power: 450 milliwatts
Record audio output: Earphone jack
Recorder activator: No
S meter: No
Computer interface: No
Conversion scheme: Double conversion
Sensitivity: 0.4 uV 29-54/136-174 MHz, 0.5 uV 406-512 MHz, 0.8 uV 118-136 MHz, 1uV 806-956 MHz
Selectable preamplifier: No
Selectable attenuator: No
Selectivity: (-55 dB) 50 kHz
Image rejection: Unavailable
Frequency stability: Unavailable
Selectable AGC: No
Dynamic range: Unavailable
Passband tuning: No
Noise blanker/limiter: No
Adjustable notch filter: No
Tone control: No
Antenna connector: BNC
Auxiliary connector: No
Dimensions: 2-11/16"W x 7-1/2"H x 1-3/8"D
Weight: 1-1/4 lbs.
Power requirements: 12 VDC (internal nicads)
Warranty: One year
Accessories included: Earplug, AC wall adaptor/charger, flex whip, leatherette case

AOR AR-1000XC

Frequency range: 500 kHz-1300 MHz
Keypad frequency entry: Yes
Tuning steps: Any 5-955 kHz (divisible by 5 or 12.5)
Display: Backlighted LCD
Dimmer: No
Type of listening recommended: VHF/UHF communications, casual shortwave broadcasting
Receiving modes: AM, wide FM, narrow FM
Memory: 1000 channels, non-volatile
Scan: 20 channels per second
Banks: 10
Lockout: Yes
Priority: Any channel
Search: 20 increments per second, ten ranges linkable
Delay: All-channel
Squelch: Yes
Clock: No
Audio output power: 400 milliwatts
Record audio output: Earphone jack
Recorder activator: No
S meter: No
Computer interface: No
Conversion scheme: Triple up-conversion; 561.225, 58.075, 10.7 MHz (or 455 kHz AM)
Sensitivity: 0.35 uV NFM, 1 uV AM/WFM
Selectable preamplifier: No
Selectable attenuator: 10 dB
Selectivity: Not Available
Image rejection: Not Available
Frequency stability: Not Available
Selectable AGC: No
Dynamic range: Not Available
Passband tuning: No
Noise blanker/limiter: No
Adjustable notch filter: No
Tone control: No
Antenna connector: BNC
Auxiliary connector: No
Dimensions: 2-1/2"W x 6-7/8"H x 1-3/4"D
Weight: 12 oz.
Power requirements: 9-13.6 VDC (4 AA nicads) included
Warranty: One year
Accessories included: AC wall adaptor/charger, flex antenna, cigarette lighter power cord, vinyl carrying case, belt clip



The ICOM R-1 (top) shown with the AOR AR1000XC (left) and Uniden BC200XLT (right).

tuning steps for search (with autoload) and the rotating dial of 0.5, 5, 8, 9, 10, 12.5, 15, 20, 25, 30, and 50 kHz, matching virtually any imaginable channelization plan.

One hundred memory channels may be scanned in ten banks, with a choice of AM, narrow FM, or wide FM on any frequency. All-channel scan resume delay may be the standard two seconds after the signal drops out, or the awful 10 seconds no matter what.

An LCD bargraph provides excellent relative signal strength indication. A brightly-edge-lit LCD is readily seen at night, showing easy-to-read frequencies to four decimal places and not-so-ease-to-read function legends. Even a clock with on/off timer is included.

Sensitivity is on par with the competition; sometimes a little better, sometimes a little less. Scanners often suffer from inconsistent sensitivity at different frequencies.

...And the Bad News

Front end overload is dismal, especially with an external antenna. Artifacts ("splatter") from one FM station about 5 miles from here can be heard far from the tuned frequency. Intermod from a more distant paging transmitter was loud and clear.

Shortwave selectivity is very broad, with strong adjacent broadcasters obscuring weaker signals.

Dual-function keys are used to accommodate all the functions Icom wants you to have whether you want them or not; they are cumbersome to learn to operate, but will become familiar with time.

mt

Satellite Television Sourcebook
by Ken Reitz
is available through the following:

EEB	800-368-3270
DX Radio Supply	215-273-7823
Grove Enterprises	800-438-8155
Shop at Home	800-366-4010
Universal Radio	800-431-3939
VHF Communications	800-752-8813
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MOVING?

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Doug Demaw, W1FB

The Art of Winding Coils

I have received a number of letters from *MT* readers in which the writers asked for information about winding coils. In fact, two of the experimenters asked if I would wind the coils for their projects.

Amateurs and other builders have been winding all manner of coils (inductors) and transformers since the art of radio was born. It was tedious at best when some of us wound an oatmeal box full of no. 30 wire while constructing a crystal-set radio for the standard BC band. Not only was it necessary to keep the close-wound turns from overlapping one another or becoming kinked, the cramps which developed in the palm of the winder's hand were annoying.

Most experimenters still use the by-hand method for winding tubular and toroidal coils, but there are some tricks you can employ that will make the task less difficult. Let's discuss some useful techniques.

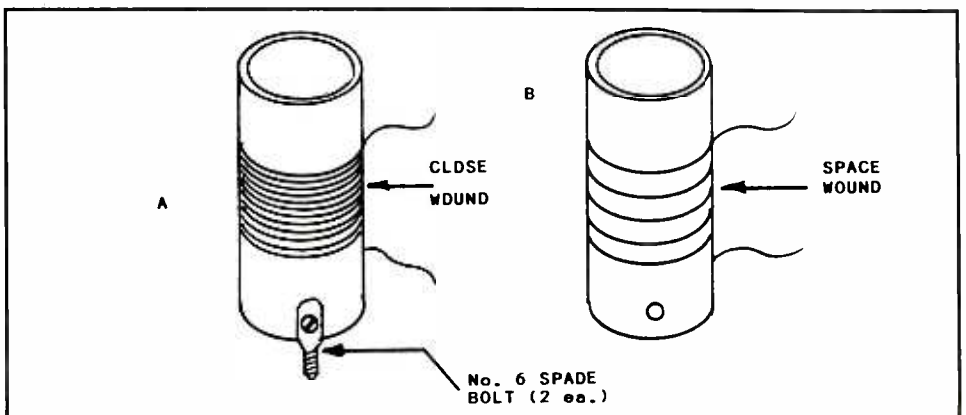

Figure 1

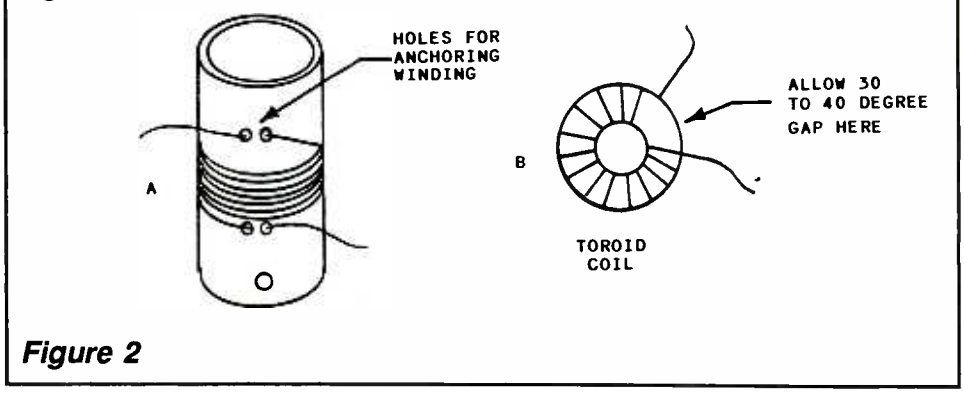

Figure 2

Tubular Solenoidal Coils

A coil may be close wound with one turn immediately next to the preceding one, or it may be space wound. The latter type has a gap between the turns. The gap may vary from one wire diameter to several, depending upon the desired form factor (coil length versus coil diameter). Figure 1 shows a close-wound and a spaced-turn coil.

Our concern about the coil form factor is related mainly to the coil Q (quality factor). The higher the Q the lower the ac loss in the inductor. High-Q coils in tuned RF circuits yield the greatest selectivity or signal separation. It is generally conceived that a 1:1 form factor will provide the highest Q. Thus, if the winding length of the coil is two inches, so must be the coil diameter. Large diameter coil wire also increases the Q. A good rule is to use the largest wire gauge practical when winding a coil.

I have found through lab experiments that form factors as great as 2:1 are acceptable in terms of Q. Specifically, there is little difference in the Q when a coil is two inches long and one inch in diameter, as compared to a 1:1 factor coil. As the ratio is increased beyond 2:1 there will be a measurable decrease in coil Q.

Coils with magnetic cores (slug-tuned coils with powdered iron or ferrite cores) follow the foregoing rule for Q, but the core material has a major effect on the Q. The core recipe must be suitable for the chosen operating frequency in order to ensure high Q. Beware of surplus coil forms that contain core material of unknown properties. The wrong core can ruin the Q of an otherwise good coil.

Winding the Tubular Coil

Once you know the number of coil turns required, plus the wire gauge, wrap one turn around the coil, then remove it and measure the wire length. Multiply this length by the specified number of turns. Allow two or three inches of extra wire for each end of the coil. Cut the wire from the spool and set it aside.

Drill two small holes in the coil form for each end of the winding. If you're using a slug-tuned coil, solder one end of the wire to the metal lug at one end of the coil form. If you drill two holes at each end of your coil form, loop one end of the precut wire through one set of holes, as shown in Figure 2. Rotate the coil form with your left hand (right-handed persons) while tensioning the wire with your right hand. Wind the coil so that each new turn presses slightly against the previous turn as you wind. This will help to keep the turns close together on the coil form. Finally, insert the free end of the wire in the remaining two holes and pull it tight.

If your hand becomes cramped during the winding task or if the phone rings, simply affix the last few turns to the form with a piece of Scotch-brand tape until you can resume winding the coil.

You may prefer to use a drill motor and motor-speed control to slow the rotation to facilitate the winding of a large coil with many turns of heavy-gauge wire. A wooden mandrel can be placed inside the coil form and affixed with two screws to permit coupling it to your drill motor or drill press. A foot switch is handy for controlling the drill motor during this process.

Slug-tuned coils, which have a threaded, adjustable core, enable you to vary the coil inductance over a limited range, whereas ordinary coils have a fixed value. Try to arrange your slug-tuned coil so the desired inductance is obtained when the slug is approximately 1/3 the way into the coil winding. This provides good Q and ample leeway for coil adjustment.

Adding Links to Coils

When using a second winding (link) over or adjacent to the main winding, I like to place a thin layer of insulation between them. This prevents the possibility of the two windings developing a short circuit between them. I often use Teflon pipe-thread tape for this. Masking tape or Scotch tape may also be used for this purpose.

Almost without exception the link is located at the cold (grounded) end of a coil. It is wound on the coil form in the same sense or polarity as the main winding, right- or left-hand circularity. If the bottom of your coil is not grounded, per se, place the link over the B+ or Vcc end of the coil. This will be the ac or RF ground end of the coil.

Winding Toroids

Premeasurement of the coil wire follows the same rule as outlined for conventional coils. Ferrite cores often have sharp edges and this can cut through the enamel insulation of the wire. It is wise, therefore, to first wrap this type of core with Teflon plumber's tape. Most powdered-iron cores are tumbled and have smooth edges.

Once you have precut the wire for your toroidal coil, simply loop it through and through the core until all of the turns are in place. Try to leave a 30- to 40-degree gap where the ends of the winding occur. This will help maintain good Q. The winding can be glued in place with two coatings of General Cement polystyrene Q Dope if you wish. I have used polyurethane varnish for this purpose too. Marine spar varnish is also a good low-loss coil cement. These products are good for securing any coil you wind and they prevent dirt and moisture from affecting the coil performance.

Although the link on a toroidal coil may be wound over the cold end of the inductor, it is okay to spread it over all of the main winding. Industrial designers often do that.

Concerning Space-Wound coils

If you desire to keep the space-wound turns on your coil a uniform distance from one another, you may use a piece of string or cord to separate the turns as you wind the coil. The cord is laid on the coil form along with the wire as you wind. After the winding has been completed you may tack it (string included) at several points by means of hobby cement. Once the glue has dried, remove the string carefully and coat the winding with one of the compounds mentioned earlier.

Layer-Wound Coils

We need to wind RF chokes from time to time. This calls for very light-gauge wire which must be placed on the choke form in layers. Experimenters could once purchase a gadget called the Morris Coil Winder which was ideal for this application. If you do not have access to such a device you may scramble-wind the wire on your choke form by winding back and forth from one end of the form to the other. Continue this process until all of the wire is in place. A word of caution: this winding method does not produce chokes with high values of Q, but they are acceptable for most circuits that call for an RF choke.

I have wound low-inductance VHF and UHF chokes on pieces of plastic drinking straws. Plastic darning needles also serve nicely as forms for low-inductance chokes. Many of my VHF toroidal coils are wound on home-made toroids that I fashioned from Plexiglass or a similar low-loss insulating material. Toroids need not have magnetic core properties to qualify as toroids.

In Summary

I hope these tips will help unravel the mysteries of coil winding for you. Coil winding can be a pleasant part of your project if you are willing to take the time to learn the art. Certainly, winding our own coils saves money, but just as rewarding is the sense of achievement.

Bill Cheek

Homebrewing a Scanner Antenna

I don't ordinarily encourage serious communicators to monkey around in the "roll your own antenna" department. If you're an antenna engineer or if antennas are the focus of your life, then have at it. If you're a typical ham or CBer, there are better ways to spend time and money than in conjuring antennas which can be more expensive and less effective than off-the-shelf market models. The ham and CB bands are so competitive that every decibel of gain is needed at times to get the signal "out there." State-of-the-art has come a long way for hams and CBers and it makes little sense to compete with that mega-million dollar antenna industry which has all the angles and casual discoveries worked out to a science.

It's different for shortwave listening and scanning where antenna technology is not so avant-garde. Plenty of room is left for chance discovery and Saturday development. An industry is emerging for SWL and scanner antennas, but it doesn't approach the level of that for ham, CB and commercial radio. SWLing and scanning both require broadband antennas, although they are about as similar as snakes and toads. SWLs have it worse because of size requirements for their antennas. Thanks to the inverse relationship of dimension to frequency, however, scannists can have their cake and eat it, too, given a broadband antenna and GAIN.

When a dipole is fed at some point off-center, its bandwidth widens appreciably, depending on the offset. Off-center-fed (OCF) dipoles can be made to cover most of the scanner bands of interest, from VHF-Lo through 900 MHz, and there will be a bit of GAIN, maybe as much as 2 dB on some bands. An OCF-dipole is easy to make with minimal materials and cost, and its performance will equal or even exceed market models.

Review Figure 1 for a schematic and simplistic approach to the concoction of an OCF-dipole. You can stop there if you like and get right to work with a few feet of wire, matching transformer and coax, or you can ponder the basic idea in Figure 1 and proceed to Figure 2 for a hot-dawg "roll your own" OCF-dipole. Before you get started, let's briefly cover a little known tidbit about bandwidth of antennas.

As the diameter of an antenna increases to an appreciable fraction of its length, the bandwidth increases. This applies especially to VHF/UHF dipoles. So in Figure 2 we'll not only offset the feed point from center to yield a wider band of operation, but we'll also use three-quarter inch copper water pipe to create substantial diameter for greater bandwidth without sacrificing GAIN or performance.

One beauty of this project is that you can follow my directions exactly or you can deviate for potentially superior results. For example, you needn't stop at three-quarter inch copper. Why not one inch? I saw fittings for 1-1/2 inch and 2 inch copper pipe at a hardware store, so go for the gusto if you can find the materials.

Why stop there? Several coffee cans soldered end to end or even stove pipe could be pressed into service for larger diameters. The endless possibilities can't be covered in the space allowed me by our beloved but miserly editor, so Figures 1 and 2 will suffice to convey the principles. You can let your imagination and ingenuity run amok from there. Thanks to Darwin Teague of Indiana for the idea of copper pipe for this month's project. Now here's what you need to know:

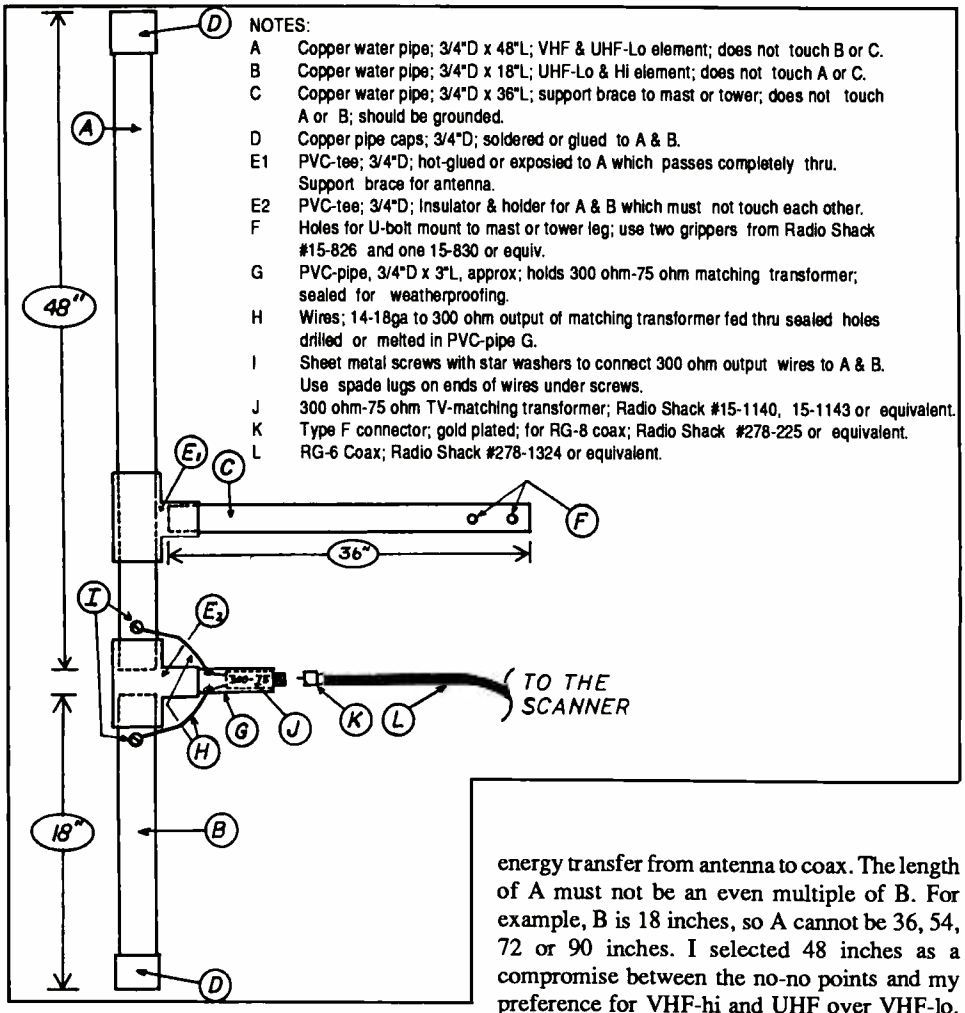

Figure 1: Scanner Antenna Plans

Construction:

Figure 1 shows the principles and basics of an OCF dipole. The two elements must not touch. The matching transformer maximizes energy transfer from antenna to coax. The length of A must not be an even multiple of B. For example, B is 18 inches, so A cannot be 36, 54, 72 or 90 inches. I selected 48 inches as a compromise between the no-no points and my preference for VHF-hi and UHF over VHF-lo. You could make A equal to 63 inches or even 81 inches if VHF-lo is your greater interest. Use low loss RG-6 coax, though RG-59 will do if you insist.

These are the few rules for success with a OCF-dipole. Now let's review Figure 2 for a practical application and a class act.

Keynotes of Figure 2 include three-quarter inch copper water pipe for the elements and support brace to the mast. PVC tee fitting E1 is an insulated holder for the antenna A and B and a mount bracket for the brace, C. Element A passes completely through E1, and is permanently affixed to E1 with epoxy, silicone rubber, hot glue or a screw. E2 is primarily an insulator and a holder for the two elements A and B but it also serves to accommodate the weatherproof housing G for the TV matching transformer J. After the matching transformer is placed inside G and the 300 ohm wires are poked through the two holes H, seal all openings with epoxy, silicone rubber or hot glue. Likewise, after A, B and G are inserted into E2, fix them in place with an adhesive.

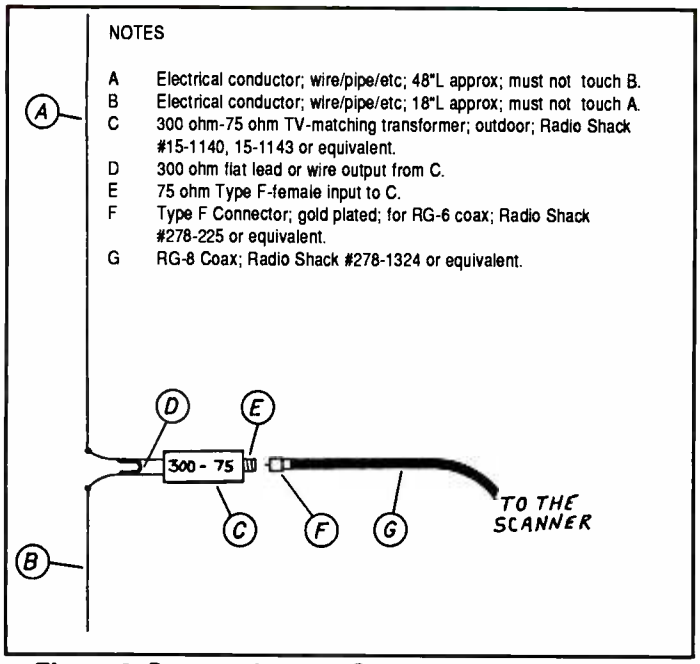

Figure 2: Scanner Antenna Schematic

Precise placement of E1 is not critical because it only supports the antenna. The closer to E2, the better, but 8 inch to 12 inch spacing between E1 and E2 is a good compromise for balance, appearance and function. Coax cable L is routed perpendicular away from the antenna A and B, NOT parallel until it secures to the mast or tower at F.

Assembly Notes:

You'll notice that three-quarter inch PVC fittings do not exactly mate with three-quarter inch copper. The outer diameter of three-quarter inch copper pipe is between 13/16 and 7/8 inch, so the PVC will have to be reamed a little for a good fit. A seven-eighth inch flared-type wood boring bit works fine.

For E1, insert the bit, shank first, through the PVC tee and then into a drill chuck. Ream the length of E1 for A by pulling the rotating bit all the way through in lieu of normal pushing. You can also use the "pull" technique to partially ream E2 at each end for A and B, but obviously the "push" technique is required at E1 for C. E2 need not be reamed for G because PVC fits perfectly.

Brace C need not be exactly 36 inches, but if it is much less the antenna's performance can be affected by a metal tower or mast. Longer is better, but copper bends with weight and leverage, so 36 inches is a good compromise.

The 300 ohm output wires H must be solidly connected to A and B. Solder these leads to A and B or put spade lugs on the wire ends and use sheet metal screws to secure them to the copper wire with star washers between the copper and lug and between lug and screw head. Weather-seal solder joints or screw heads with silicone rubber after connection.

After assembly, weather-seal with silicone rubber all entry/exit openings of the copper and PVC. Prior to assembling the antenna, steelwool all surfaces of the copper to a bright shiny lustre. Remove fingerprints and smears before installation and spray all exterior surfaces with several coats of acrylic or lacquer: clear if you want attention and admiration, white or baby blue for a lesser invasion of the skyline, or red to infuriate the neighbors.

The OCF-dipole is shown with the long element on top. It's better that way, but if you disagree, then put the short side up. See if I care. Just don't forget to reverse the relative positions of E1 and E2, because the coax must be below the support brace C.

Please let me know of your successes or failures with this project and about other innovative developments.

Manufacturers of Antennas for Scanners:

Antenna Specialists Company
30500 Bruce Industrial Parkway
Cleveland, OH 44139-3996
216-349-8400

Barker & Williamson
10 Canal St.
Bristol, PA 19007
215-788-5581

Centurion International, Inc.
P.O. Box 82846
Lincoln, NE 68501-2846
402-467-4491

Channel Master/Div Avnet
P.O. Box 1416
Smithfield, NC 27577
919-934-9711

Dynascan Corporation
6460 W. Cortland
Chicago, IL 60635
312-889-8870/800-262-7222

Firestik Antenna Company
2614 E. Adams
Phoenix, AZ 85034
800-528-8113

Grove Enterprises
140 Dog Branch Rd.
Brasstown, NC 28902
704-837-9200

ICI Active Antenna Systems
4521 Campus Drive, #113
Irvine, CA 92715
714-720-8159

ICOM America, Inc.
2112 116th NE
Bellview, WA 98004
206-454-7619

ICOM Canada, Inc.
3071 #5 Road
Richmond, BC Canada
V6X 2T4

Larson Antennas
11611 NE 50th Ave
P.O. Box 1799
Vancouver, WA 98668
800-426-1656/206-573-2722

New-tronics Antenna Corp.
One New-tronics Pl.
Mineral Wells, TX 76067
817-325-1386

RF Limited
P.O. Box 1124
Yissaquah, WA 98027
206-392-0399
FAX: 06-392-0419

Russell Industries, Inc.
3000 Lawson Blvd.
P.O. Box 508
Oceanside, NY 11572
516-536-5000

Winegard Company
3000 Kirkwood St.
P.O. Box 1007
Burlington, IA 52601-1007
319-753-0121

Wintenna Inc.
911 Amity Rd.
Anderson, SC 29621
803-261-3965

If you contact the above companies, please mention you heard about them in *Monitoring Times*.

W. Clem Small, KR6A, CET

Something Old, Something New . . . .

Let's start with the relatively new. If you haven't yet seen the 1991 *Antenna Buyer's Guide*, it might be worth your while to check it out before we move on into 1992. It is broad in its coverage, including a large number of commercially available antennas. You'll find beams, verticals, wire antennas, rubber duckies—you name it and it's there.

In a sense this is a giant catalog of various manufacturers and antenna-related products. Included are items like coax switches, tuning and matching devices, and antenna test equipment. There are also some articles describing home-built antennas for the do-it-yourselfer.

This publication is from *CQ*, an amateur radio journal, but its contents should be of interest to SWLs as well as to amateurs. It is available at larger magazine stands as well as directly from CQ's Ham Radio Bookstore, Greenville, N.H. 03048.

Next, something not quite new but not old, either. Although it was published in 1988, I just got a copy of Ed Noll's *Easy-up Antennas For Radio Listeners and Hams*. Noll does a good job of introducing the newcomer to a wide variety of antennas and the necessary "supporting" information, such as how to build simple towers and how to test and tune-up your antenna.

You will find many different antenna designs described for use with longwave, mediumwave, shortwave and UHF/VHF signals. This book is published by Howard W. Sams & Company, and should be available at most radio supply houses which carry books for the shortwave listener.

Out of the Past Come the Thundering Hoofbeats . . .

Now for the "old" something promised in the title. Long-time *Monitoring Times* reader Samuel U. Ledford wrote to ask for a column on the "old-time cage antenna and the three and four wire antennas" of days gone by.

How many of you readers have even heard of the cage antenna or the old multi-wire antenna types? Well, these old-timers can still be used, so we'll cover the basics here for those of you who may want to try a nostalgia trip into antennaland.

In the early days of radio the antenna of a radio system was thought of in terms of its being a physically large capacitor. We still think of an antenna as having capacitance, but we don't generally talk of it as actually being a capacitor. However, back then, emphasis was on conceptualizing the "aerial" as one plate of a capacitor, and the ground under the antenna as the other plate of the capacitor.

Since early radio experimenters used low frequencies, it was generally desirable for an antenna to have as much capacity as possible to make the antenna's natural resonant frequency closer to the desired operating frequency. The use of multiple conductors gave more surface to the antenna, and thus the capacity between antenna and ground was greater. One design even had the general shape of an umbrella. Figure 1, taken from the 1922 U.S. Signal Corps manual, *The Principles Underlying Radio Communication*, shows several of these multi-wire antennas.

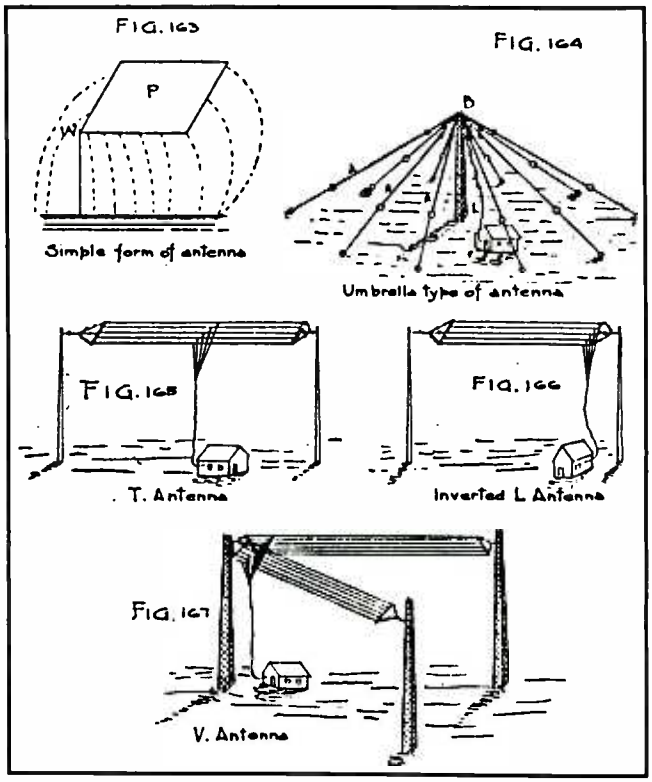

Figure 1: *Multiple-wire Antennas*

Figure 2, taken from the same manual, shows an example of the old-fashioned cage antenna. This demonstrates another reason the early pioneers looked with favor on the multiple-wire antennas: antennas with a larger diameter have a wider bandwidth. Greater bandwidth, of course, means the antenna performs more effectively over a broader range of frequencies. This applies in particular to the cage antenna, which approximated a metal cylinder in skeletal form. This gives the cage antenna a considerably greater bandwidth than single-wire antennas.

Today these antennas still find application at transmitting stations when the operating frequency is as low as the old-timers used, down in the low-frequency end of the spectrum. If you want to increase the bandwidth of your antenna, a cage design can still help you get the job done. At UHF where it is physically easier to make such elements, the cage is replaced with a cylinder, giving it even greater bandwidth.

Due to the long waves of the lower frequencies, the length of the old-time antenna was sometimes measured in miles. If you want to experiment with antennas shown in Figure 1 for shortwave reception, you can make them random length, whatever is convenient for your location. An antenna tuner might help a bit on really weak stations, but is not really necessary for receiving purposes. On the other hand, you will surely need an antenna tuner if you plan to use the antenna for transmitting.

The bottom of the vertical cage antenna is connected to the center conductor of a 50-ohm coaxial feedline, and the shield of the coax is connected to a good ground connection just below the antenna. In this case, the length of the antenna is one-quarter wavelength long, and the length is given by: quarter wavelength antenna in feet = 234/frequency in megahertz.

The Signal Corps manual referred to above tells us that the cage antenna may be made of "a number of wires, often six or eight, . . . suspended from a single point and kept apart by star shaped separators which may be of wood, or by hoops." Of course, the flat top types can be spread on a wood slat.

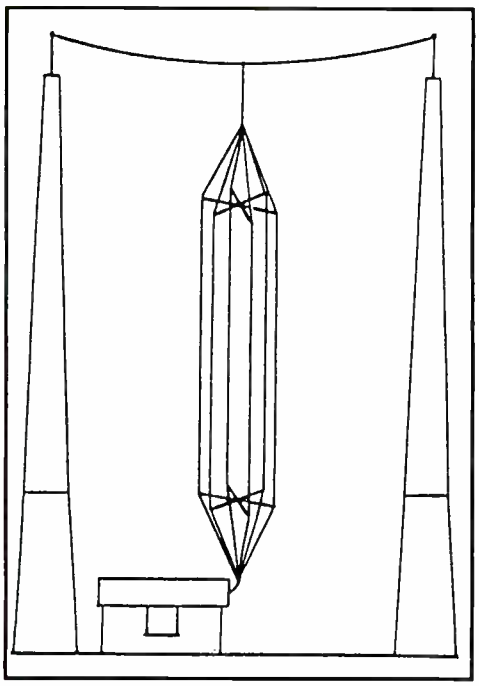

***Figure 2:** A cage antenna*

RADIO RIDDLES:

Last month:

I asked, "What's the difference between a Marconi antenna and a Hertz antenna? And, what are these two antennas anyway?"

Well, the horizontal halfwave dipole antenna is the direct descendent of the first antenna designed by Hertz, the person who first showed the world that radio waves existed. Marconi, in attempting to increase the range of his wireless, mounted half a Hertzian halfwave dipole vertically and produced the quarterwave vertical design which still bears his name.

So each time you work with a halfwave dipole or a quarterwave vertical, you are privileged to be dealing with a page from radio's fascinating history.

This Month:

What led Hertz to look for radio waves and thus develop the world's first transmitter, receiver and antenna? Why did he even think there were such strange things as electrical waves that travel through space?

Well, that's it for this month. Get the answer to this month's radio riddle, and much more, in your next month's issue of *Monitoring Times*.

ask bob

Bob Grove, WA4PYQ

Several readers took exception to my answer in the August 1991 column as to why aircraft communications are AM rather than FM.

Years ago I had been told that because of the FM "capture effect," the strongest FM signal would be heard, blocking out a weaker one, but with AM a weak emergency signal would still be heard as co-channel interference.

Several long-time pilots disagreed. They said that the widespread use of AM mobile radio in World War II aircraft created an abundant surplus market after the war; these radios were gobbled up by the airlines. Later conversion to FM was financially prohibitive.

Makes sense. And because it involved money, it's probably true.

***Q.** Frequency directories come out so often; do FCC records really change that much? (Many readers)*

A. Recently, Gene Hughes, founder and editor of *Police Call*, did some research on his own. In one year, expirations, cancellations, modifications and additions to his FCC records accounted for a staggering 25% of all licensees!

***Q.** Is there any way to improve the audio quality on my hand-held scanner? (Dale Johnson, Bloomington, IN)*

A. If you are experienced in electronic circuitry and don't mind voiding on your warranty, and your scanner has plenty of reserve volume, there are some easy fixes for poor audio.

You can make bassy speakers sound "crisper" by adding an electrolytic filter capacitor in series with one of the speaker leads. Experiment with values; 10 uF is a good start.

If the sound is too shrill, put the capacitor across the two speaker leads.

If there is a residual hiss coming through the speaker even when the volume is turned down or the radio is squelched, a small resistor in series with one of the speaker leads will help. Try 47 ohms to start.

***Q.** I recently had the misfortune of dropping my scanner into water. When I opened it up to let it dry out, I noticed several printed references to a transmitter; there was even a space for a transmit button.*

Can this unit be modified to transmit? (Robert Wilyzinski)

A. No. It is common for manufacturers to make one circuit board common for several models of radios. While it may be theoretically possible to fill all the missing holes with appropriate components, it would probably be impractical.

Some existing circuitry would undoubtedly have to be modified as well, and it is highly unlikely that the manufacturer would be willing to provide the schematic, parts list and details for you to finish his job for him.

***Q.** Can any MT readers assist me in finding the parts for a "Morse/RTTY Detector" featured in the April/May 1990 Radio Electronics magazine by Larry Ashworth, KA7AFR? He lists Power Mountain Systems of Cora, Wyoming, but they appear no longer to be in business, and Radio Electronics hasn't answered my two letters.*

Additionally, do any of your readers know of a good RTTY/AMTOR/CW software program for the Apple IIE? (Bill Pearson, 24 Brunton Place, Glenfield, Auckland, New Zealand)

A. Can any of our readers help our friend in New Zealand?

***Q.** I have a commercial 800 MHz ground plane antenna connected to my scanner, but still can't hear any cordless phones; why not? (Stanley Barnett, Booneville, MS)*

A. Because cordless phones are in the 46/49 MHz band; trying to hear those frequencies on an 800 MHz antenna is like trying to chisel marble with a banana. The two aren't made for each other.

***Q.** If I program my frequencies into my scanner in order of increasing frequency, will they scan faster? (David Dube, Windsor, Ont.)*

A. The limiting factor on scan/search speed is how long it takes for the tuned circuitry to track each frequency change. While some AOR products do increase their scan/search speed if the memory frequencies are in order, most manufacturers have a fixed rate which allows any frequency change to reach full sensitivity.

***Q.** How does digital security coding on cordless phones work? (Edward Audi, Burlington, VT)*

A. The base and handset units must recognize each other's digital tones in order to complete a call. While this won't prevent an outside party from listening in on a scanner, it will prevent unauthorized access to your cordless base unit by someone else's handset without the proper code.

***Q.** Where can I find voice weather information in the shortwave bands? (Carl George, Durham, NC)*

A. Both marine and flight weather advisories are heard nearly continuously throughout the shortwave spectrum in the upper sideband (USB) mode. My *Shortwave Directory* contains exhaustive listings of these broadcasters and their schedules.

Frequency lists and transmissions schedule are also found in *Gilfer's Confidential Frequency List* and Klingenfuss's *Utility Guide*, available from several *MT* advertisers.

***Q.** Is it true that the military SINCGARS 150-channel-per-second, frequency-hopping radio system is undetectable on a conventional radio receiver? (Eric Carvill, East Sussex, England)*

Questions or tips sent to "Ask Bob", c/o MT, are printed in this column as space permits. If you desire a prompt personal reply, mail your questions along with an SASE (no telephone calls, please) in care of MT.

A. If it really moves along that fast, a normal receiver would detect nothing more than a slight rise in background noise. certainly no intelligibility would remain.

***Q.** After several years, the lamp in my Eye-Comm microfich reader finally burned out. Can I get a replacement? (Mark Chinsky, Glen Head, NY)*

A. You sure can: $14 plus $6 COD from Eye Communication Systems, 117 Hill St., Hartland, WI 53029. You can save the COD charge by locating the bulb, a type FLT (part #1006), at a microfiche supply dealer.

***Q.** (1) What kind of radio and antenna can pick up AM and FM broadcasts from up to 2000 miles away in any kind of weather? (2) What kind of radio and antenna can listen in on radio network feeds, like Mutual, directly? (B. Greenman, Chicago, IL)*

A. (1) None. (2) A satellite TV dish and receiver tuned to Spacenet 3, transponder 17. It's also on Ku band.

***Q.** I notice that there are some scanners and receivers with frequency coverage in the 1000-2000 MHz spectrum; are there voice signals up there to listen to? (Angus Ashdown, Lexington, MO)*

A. The vast majority of signals to be encountered in the 1-2 GHz (1000-2000 MHz) band are short-range microwave data transmissions. There is some amateur communication from 1240-1300 MHz, military and government FM from 1700-1850 MHz and telephone links from 1850-1990 MHz.

The microwave region is bursting with innovative technologies that make this the new frontier for communications and recreational monitoring.

Bob's Tip of the Month

Using an Attenuator to Reduce Scanner Overload

David Ricker, Tucson, AZ, tells us of the success he had recently using an inexpensive Radio Shack attenuator to cure a severe overload problem with his PRO-34 scanner.

Dave purchased, from his local Radio Shack dealer, a 6 dB attenuator (#15-1257), an RF adaptor (#278-251), and a BNC plug (#278-256). Attaching these in series with his antenna, Dave enjoyed a remarkable improvement in reception for less than $7.

Years ago, the chief engineer at Electra (then manufacturer of Bearcat scanners) replied when I asked him about preamplifiers for scanners, "They don't need preamplifiers; they need attenuators!" In strong signal areas, he certainly was correct.

LETTERS

continued from page 3

Band! It could always use the help. REACT International (Radio Emergency Associated Communications Teams), a worthy service organization, reports a decline in volunteer monitors. According to their national office, "REACT needs more monitors to answer the increasing number of calls for help on CB Emergency Channel 9." If you'd like to find out how to help, write 242 Cleveland, Wichita, Kansas 67214 or call 316-263-2100.

Speaking of CB, Jim Slater of Pennsylvania sent along his photo and says his CB friends enjoy sharing his copy of *MT*. He asks, "Why isn't *MT* on the newsstands? There are a lot of people asking how to get it."

Past experience has shown that the best sales come from people like you, Jim, who spread the word about *MT*. Most newsstands will only buy from a magazine distributor, and those vendors reserve the right to return any unsold copies, sometimes even months later. Even though we use past issues as sample copies, few people would appreciate receiving one six months old!

We do sell over 4,000 copies per month to radio equipment and book stores, however; call us to see if there is a dealer near you. Ask your local supplier to give us a call if they don't carry *MT*. Or tell your friends to send us $3 for a sample issue. Better yet, tell them to subscribe and eliminate the middleman altogether!

Two conscientious readers have several corrections to September's Erie Canal article to pass on. The 1991 *Police Call* used for Table 4 was evidently the primary source of error. David Stark of Rochester has this updated report:

Service	Incorrect	Correct
Albion PD	39.400	155.430
Brockport PD	154.940	158.940
Fairport govt	46.580	Fairport Electric Co.
Holley PD	39.140	155.430
Lyons PD	154.752	154.725
Medina PD		155.430
Middleport PD		155.430
N. Tonawanda FD	144.130	154.130
Rochester FD	46.10(statewd)	45.88

David says the frequencies listed for the Buffalo police are the repeater inputs. Outputs are 5 MHz lower.

In Table 5, he says the Rochester airport is 119.550 and 269.600 (among others) instead of 119.500 and 296.9.

David Dombrowski of Tonawanda also supplied corrections plus some additions:

Buffalo:

PD	F-1	460.325
	F-2	460.350
	F-3	460.425
	F-4	460.475
	F-5	460.025
FD	F-1	154.190
	F-2	153.890
Ambulance Dispatch		155.715

Lockport:

Police	155.250
Fire	46.440

N. Tonawanda;

Police	460.175
Fire	154.130

Dombrowski says the Canal also passes through Niagara County, where you can listen to these frequencies:

Niagara Co

Sheriff		154.755
Fire Control	F-1	46.060
	F-2	46.220
Ambulance Disp		155.220
Police Intersystem		39.760
Sheriff Intersystem		39.760
Fire Intersystem		45.880

Thanks, fellas. Gene Hughes, I hope you're taking notes.

NASA, Are You Listening?

Last month ham columnist Ike Kerschner did some creative brainstorming about an amateur "eye in the sky" which is already within our grasp technologically.

Fred Lehman of Ohio came up with an SWL's fantasy which is not as difficult, yet has never been done. He says, "Since amateur radio got to go on various shuttle missions, I propose this: Have a communications receiver set to scan for AM, SW broadcast, VHF, UHF and TV. I remember reading in an old *Popular Electronics* about doing this type of experiment on the moon. Considering the RF power of many broadcasters, it would be interesting to see a printout of what an individual would hear."

What do you think, readers? Is there valuable information to be gained here, or are the answers already known? It might be a worthy project to test what makes it through our atmosphere.

Digging Below the Surface

John Dowlan says he has never seen anything in *MT* "about US Navy Submarine communications and their frequencies. I feel certain someone must know how, when and where submarine transmissions can be monitored. As an old Navy vet from WWII it would warm my heart to be able to eavesdrop on this highly specialized activity."

"I would be happy to correspond and compare notes with anyone having similar interests." Write to John Dowlan, 8341 Boyce Street, Spring Hill, FL 34606.

Sounds like an assignment for one of you writers out there; how about it?

While submarine communications are down in only double-digit frequencies, Chris Hulse of Oregon does wonder about the 150 kHz bottom-of-the-dial stop for many shortwave radios. His over-active imagination conjures up this picture:

"I can just see that die-hard utility freak out there, with his dial glued to 150, covered with cobwebs, taking intravenous nourishment, not about to miss his one big chance, thinking, *sure am lucky, didn't even have to program any frequencies when I plugged this sucker radio in.* Has anyone ever reported action on this frequency?"

Not in the U.S., Chris; however, in Europe that is the beginning of the domestic AM band, which likely explains its existence on the dial. In the U.S. the first activity would be in the 160-190 kHz experimenters' band.

An Education in Shortwave

MT's standing offer of a free subscription for any class using shortwave radio in the classroom caught the eye of Chuck Yarbrough. Chuck exclaims, "I could write a book on how I use shortwave in my classes."

Chuck has recently moved from North Carolina to Georgia Southern University, where "we are currently developing an International Broadcasting class, and look forward to developing a more advanced curriculum in the area sometime soon."

"I would be glad to correspond with anyone interested in using shortwave in their classes." If you'd like to swap information with Chuck, here is the address: Chuck Yarbrough, Assistant Professor of Communication, Dept of Communication Arts, Georgia Southern University, Landrum Box 8091, Statesboro, GA 30460-8091; phone 912-681-5138.

There's more in the mailbag, but no more room here. Tuned in again next month when we'll bring you more good monitoring times.

Rachel Baughn,
Editor

We'd like to hear your comments, opinions, and experiences concerning the world of radio. Please understand that personal replies are not always possible.

Letters should be addressed to: **Letters to the Editor**, Monitoring Times, P.O. Box 98, Brasstown, NC 28902-0098.

CONVENTION CALENDAR

Date	Location	Club/Contact Person
Nov 2	**Neosho, MO**	NEOSHO ARC/Sheryl Garrison, N0ACB Rt. 4 Box 252, Neosho, MO 64850
Nov 2	**Charlotte, NC**	Discovery Place Opening Celebration on phone in the bottom 50 kHz of the general phone subbands on 75.40, and 20 meters and around 28.400. For QSL include SASE to: KK4FC, Ralph Eubanks, 60021 Coatbridge Lane, Charlotte, NC 28212.
Nov 2-3	**Odessa, TX**	Odessa Hamfest/West Texas Amateur Radio Club PO Box 7033, Odessa, TX 79760 Location: Holiday Inn Convention Center, 6201 E. HWY 80. Nov 2: 8:00 am to 5:00 pm; Nov 3: 8:00 am to 2:00 pm. Admission $7. Talk-in on 146.52 Simplex.
Nov 3	**Kaukauna, WI**	Foxcities Hamfest 91/Don Baker, NB9J 621 W. 7th St., Kaukauna, WI 54130.
Nov 4-10	**Pensacola, FL**	Serious Hams ARC Special Event Station Celebrating the decommissioning of the USS Lexington AVT-16. Operations will be in the lower portion of the General 80-15 meter subbands and 28.350. QSL to: Mike Brown, N4MAD, 519 S. Edgewood Cir., Pensacola, FL 32506.
Nov 16	**Mt Pleasant, TX**	NE Texas Amateur Radio & Electronics Trade Day Wayne Shultice, WA5OQR, Box 940, Daingerfield, TX 75638 (903) 645-3975. Location: Titus County Civic Center; 8:00 am to 10:00 pm; admission $2. Talk-in on 146.940/147.320.
Nov 23-24	**Tampa, FL**	Southern Florida Section Convention/Pat Barbiere, WB1GZW 2225 Glen Dr., Safety Harbor, FL 34695
Nov 30	**Apache Junction AZ**	Superstition ARC Hamfest 91/Chuck Kruppenbacher, KB71CP (602)986-3060. Location: P & M Rodeo Grounds, NW corner of Brown Road and Meridian. 7:00 am to 3:00 pm. Admission $1 per person. Talk-in on 147.12 MHz+.
Dec 1	**Pasadena, CA**	Toys for Tots Ham Rally/Bruce Nolte, N6TFS PO Box 41446, Los Angeles, CA 90041, (213)257-5502. Location: Rose Bowl Parking Lot #1. Admission: 1 toy valued at $5 or more. Talk -in on 145.180.

INDEX OF ADVERTISERS

STOCK EXCHANGE

Ads for Stock Exchange must be received 45 days prior to the publication date. All ads must be paid in advance to *Monitoring Times*.

Monitoring Times assumes no responsibility for misrepresented merchandise.

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1-3/4" SQUARE DISPLAY AD: $50 per issue. send camera-ready copy or copy to be typeset. Photo-reduction $5 additional charge. For more information on commercial ads contact Beth Leinbach, 704/389-4007.

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SURVEILLANCE, COUNTER SURVEILLANCE EQUIPMENT FOR SALE. WRITE SHERWOOD COMMUNICATIONS, BOX 535-G, SOUTHAMPTON, PA 18966 (215) 357-9065.

RECORD RADIO PROGRAMS WHEN AWAY OR HOME USING YOUR VCR! Record up to 8 hours worth on one tape. Easy hookup instructions. $3 and SASE to: Jed Jenkins, 1867 Tustin Ave., Dept.-MT, Costa Mesa, CA 92627.

INTERPOL, What information can you share with me? VE6WCA Rene PH/Fax (403) 436-3427 collect or write 10659-65 Ave., Edmonton, AB, T6H 1V5, Canada. Thank you for your help.

HIDDEN SIGNALS ON SATELLITE TV There is more than television on the satellites: Press services, financial services, stock services, SCPC, audio music, data-teletext systems, and more. Third edition shows you how to receive on your dish. 240 pages, hundreds of diagrams. $23 delivered UPS. Universal Electronics, 4555 Groves Rd., Suite 13, Columbus, OH 43232, 614-866-4605.

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KENWOOD R5000 MODIFICATIONS! 11 modifications, 27 page illustrated booklet. Includes carrier operated scanning! $11.45 JABCO, R1 Box 386, Alexandria, IN 46001.

UHF/VHF SCANNER PUBLICATION NORTHEAST SCANNING NEWS (NESN) is a monthly publication for scanners in the Northeast, Maine through Virginia, west to New York and Pennsylvania. Over 600 subscribers read this 60-paged newsletter. For sample copy, send $2 cash, check, or money order made payable to Les Mattson and mail to NESN, 212-MT West Broad St., Paulsboro, NJ 08066.

PRO-34 HAND-HELD SCANNER FOR SALE. Purchased on holiday to Disneyland but not suitable for our frequencies. Swap with cash difference for Sony-2010 SWR or sell $US $250. Contact John Tucker, 53 Lisa Crescent, Rotorua, New Zealand or c/o Rotorua Electricity Fax (64)(07) 347-7836.

OPTOELECTRONICS 2300 FREQ. COUNTER: $99
SONY 2010 W/KIWA MOD: $270 (Slightly scratched at bottom)
BEARCAT 200 W/ CELL REST. $200
GRE SUPER AMP FOR HANDHELD $40
MAX 800 HANDHELD DISCONE for cellular reception: $10 (BNC conn. incl.)
RADIO SHACK MAG. MOUNT ANT: $15
All include C.O.D. shipment. BUY ALL for $570. (201) 427-2517.

SHINWA SR-001, Wide band, 25-1000 MHz, 200 ch. remote included. 10 Banks. $325 mint. AOR AR2500, 1-1500 MHz, wide band, 2016 ch, 64 banks. $300 mint. (401) 568-2152. After 5PM.

FOR SALE: REALISTIC DX-440, good condition. Equivalent to Sangean ATS-803A. Best offer. Call Kannon Shanmugam at (617) 493-5963 or write to 4412 Turnberry Circle, Lawrence, KS 66047.

WANTED: CAT Hardware and/or software for C64 control of FRG-8800. Write or call: Nathan Bollinger, 716 Mack Street, Salisbury, NC 28146, phone (704) 637-8068.

YAESU FRG-9600, mint condition, manual, original box. $325. Bill Cowin, P.O. Box 694, Cadillac, MI 49601. (616) 775-0842.

KENWOOD R5000, original box, Y-88-1A AM filter. Best DX radio. $750. Money back if not completely satisfied. (602) 967-8581.

FOR SALE: KENWOOD R5000, No mods. Great condition. Eavesdropper Antenna. $725 firm, I pay UPS. (504) 626-3852.

GRE SUPER AMPLIFIER $40; PALOMAR VLF CONVERTER $40; MFJ-910 HF MOBILE ANTENNA MATCHER $12. Dann McKee, P.O. Box 2316, Winter Park, FL 32790, (407) 836-7940 Mon-Fri 8AM to 5PM.

FOR SALE-REGENCY MX-7000 SCANNER
25-550 MHz, 800-1200 MHz. Good condition $250. SONY 2010 RECEIVER-Good condition $250. Call Reginald (804) 627-4971.

Closing Comments

ALERT! CALL TO ACTION!

Write, fax or telegram your state's two senators immediately opposing Section 9 of the FCC Funding Bill. Do not photocopy the sample letter below, but retype any of its contents (in your own words if possible) without delay! Get other radio hobbyists and BBS subscribers to do the same—remember, one letter represents 1000 votes in the minds of your legislators!

(Date)

The Honorable_____
U.S. Senate
Washington, DC 20510

Dear Senator_____:

I urge you to oppose Section 9 of the Federal Communication Commission Authorization Act, Interception of Cellular Telecommunications, prohibiting the manufacture of scanning radio receivers which include cellular telephone frequencies. The FCC has gone on record opposing the blocking of cellular frequencies in scanners.

While worded to appear to protect individual privacy, Section 9 puts that responsibility on the general public, not on the sender where it belongs. It asks the listener to plug his ears rather than suggests the sender safeguard his message.

Millions of radio scanners already receive cellular telephones; even after passage of the amendment, tunable receivers, test equipment, TV sets, VCRs, and frequency converters would still legally tune cellular frequencies. Even scanners with cellular frequencies ommitted will readily receive, without modification, cellular phone calls using the image method.

The courts have continuously held--virtually without exception--that radio transmissions cannot reasonably expect privacy, and the laws of Congress will not change the laws of physics.

A ban on cellular-capable scanners would deprive millions of two-way licensees an inexpensive and reliable way to monitor interference to the cellular services which may be generated by their systems.

Such a ban would also deprive Part 15 users and Experimental Class licensees access to inexpensive, readily-available receiving equipment for their legitimate services.

The term "cellular" is generic, referring not only to mobile telephones but any radio system which utilizes this technology. The wording of Section 9 would create a regulatory nightmare for Congress to resolve.

Section 9 establishes a dangerous precedent by encouraging other licensees to demand equal protection by frequency censorship, inviting abuses of the spectrum to go unmonitored and unreported by conscionable listeners.

Section 9 is unnecessary in any case; the cellular industry has publicly stated their intent to digitize telephone calls in the near future, making them unintelligible to uninvited intrudors. Scrambling is already available to customers who request that measure of privacy.

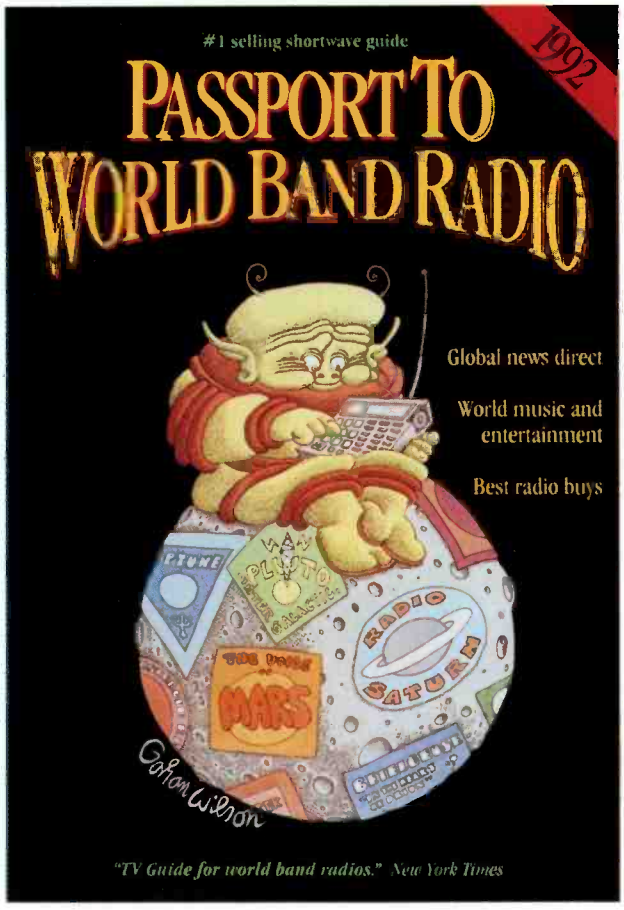
Thank you for opposing this commercially serving and poorly composed section of the FCC Funding Bill.

Sincerely,

(Your signature and address)

Accurate, up-to-date information on the status of this bill may be found on the GEnie network, Radio and Electronics BBS section, Category 4 (Electronics), Topic 10 (HR 1674).

The (shortwave) bible just got better.



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- **Larry Magne's no-holds-barred reviews** of portable and tabletop receivers sort the diamonds from the turkeys. Find out the inside scoop on the new top guns, including the Drake R8 and the Japan Radio NRD-535.
- **What's On Tonight?** An hour-by-hour guide to world band shows guides you through the best of the best and the worst of the worst.
- **Country-by-country references,** including "Worldwide Broadcasts in English" and "Voices From Home." Newly formatted to make it easy to find the station you want at the time you want.

At your dealer or bookstore now. See why *Passport* has become the largest-selling shortwave publication in North America. For further information, write *Passport to World Band Radio*, Box 300A, Penn's Park, PA 18943 or call (24 hours) 215/794-8252.

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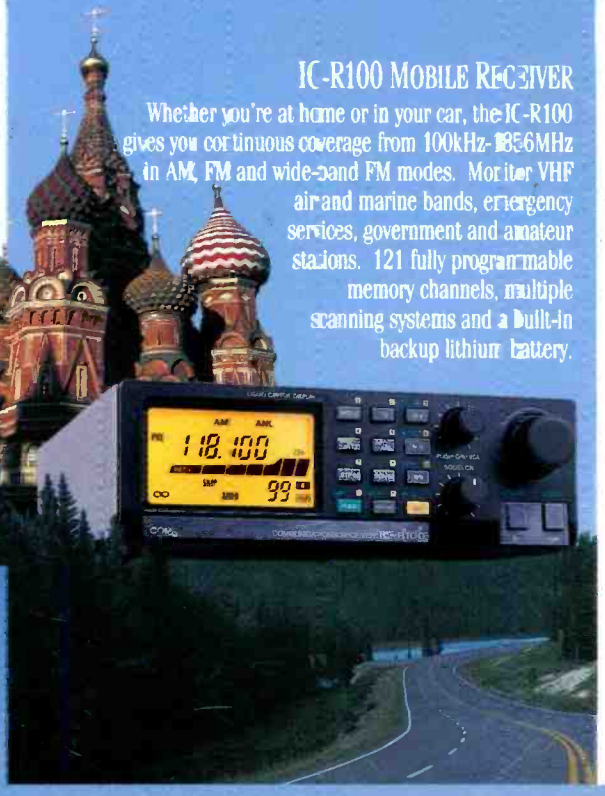

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