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MONITORING TIMES

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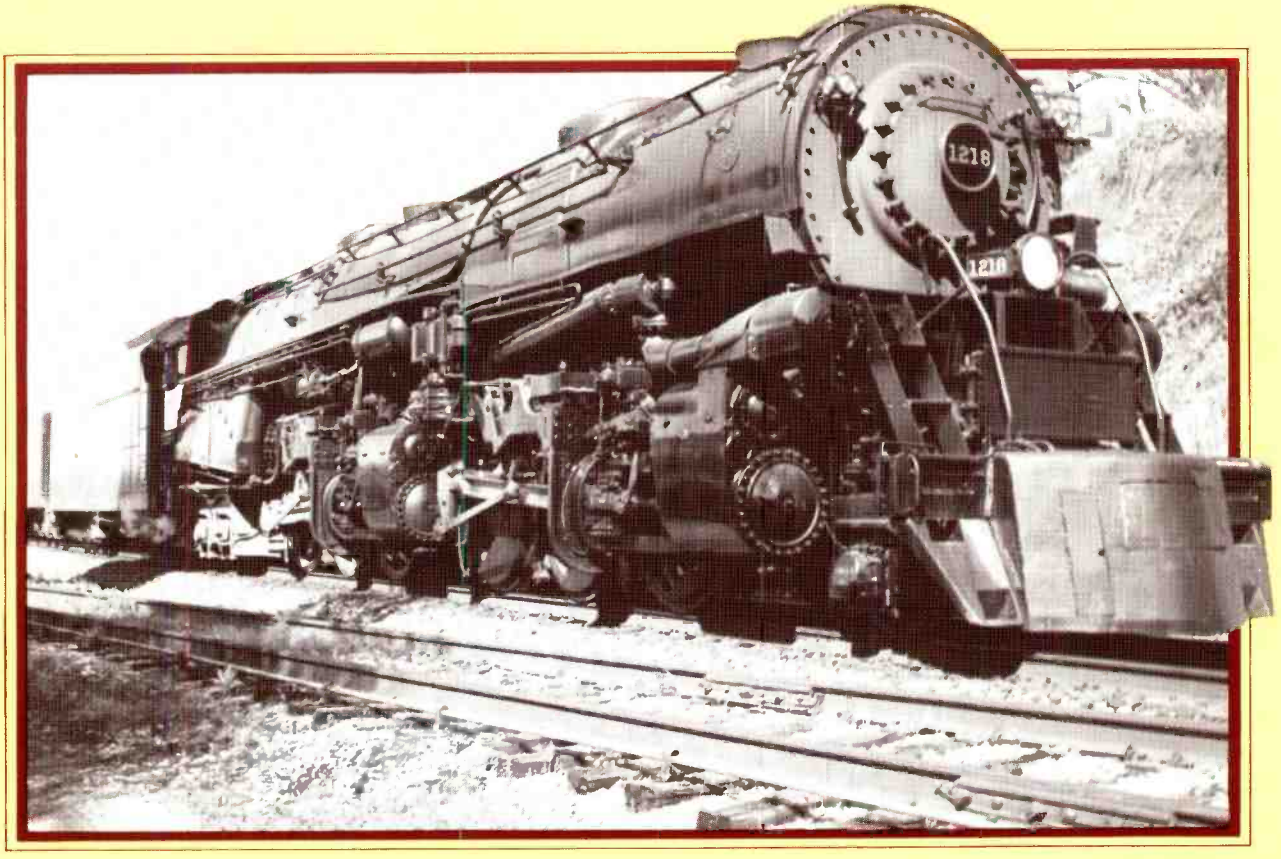

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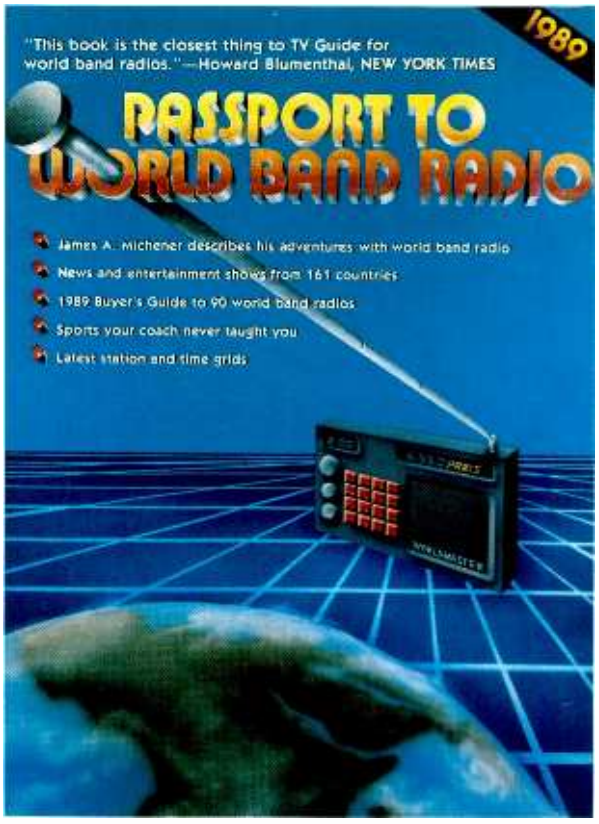

The 1989 Passport to World Band Radio

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Vol. 7, No. 7

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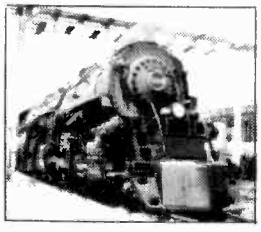
Summertime DXing -- give it a try! p.6



Ride the rails with MT, p. 9

DEPARTMENTS

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ON THE COVER: Return to the glory of the steam locomotive as MT Rides the Rails. Old 1218 proudly pulls her passengers on a nostalgic trip. (*Courtesy of Asheville Chapter of the National Railway Historical Society*).

uniden®

$12,000,000 Scanner Sale

Uniden Corporation of America has purchased the consumer products line of Regency Electronics Inc. for $12,000,000. To celebrate this purchase, we're having our largest scanner sale in history! Use the coupon in this ad for big savings. Hurry...offer ends October 31, 1988.

★★★ **MONEY SAVING COUPON** ★★★

COUPON COUPON

Get special savings on the scanners listed in this coupon. This coupon must be included with your prepaid order. Credit cards, personal checks and quantity discounts are excluded from this offer. Offer valid only on prepaid orders mailed directly to Communications Electronics Inc., P.O. Box 1045 – Dept. UNI7, Ann Arbor, Michigan 48106-1045 U.S.A. Hurry...coupon expires October 31, 1988. Coupon may not be used in conjunction with any other offer from CEI. Coupon may be photocopied. Add $8.00 for shipping in the continental U.S.A.

Regency TS2-SA7 .....$269.95
Regency TS1-SA7 .....$199.95
Regency INF1-SA7 .....$129.95
Regency INF5-SA7.....$84.95
Regency HX1500-SA7...$159.95
Regency RH256B-SA7...$324.95
Bearcat 200XLT-SA7 ...$259.95
Bearcat 100XLT-SA7 ...$184.95
Bearcat 800XLT-SA7 ...$249.95
Bearcat 210XLT-SA7 ...$177.95
Bearcat 70XLT-SA7.....$154.95

★★★★ **VALUABLE COUPON** ★★★★

NEW! Bearcat® 760XLT-SA3

List price $499.95/**CE price $279.95/SPECIAL**
12-Band, 100 Channel • Crystalless • AC/DC
Frequency range: 29-54, 118-174, 406-512, 806-956 MHz. Excludes 823.9875-849.0125 and 868.9875-894.0125 MHz.
The *Bearcat* 760XLT has 100 programmable channels organized as five channel banks for easy use, and 12 bands of coverage including the 800 MHz. band. The *Bearcat* 760XLT mounts neatly under the dash and connects directly to fuse block or battery. The unit also has an AC adaptor, flip down stand and telescopic antenna for desk top use. 6-5/16" W x 1⅝" H x 7⅜" D. Model **BC590XLT-SA** is a similar version without the 800 MHz. band for only $219.95. CTCSS squelch option now available.

SALE! Regency® TS2-SA

List price $499.95/**CE price $309.95/SPECIAL**
12-Band, 75 Channel • Crystalless • AC/DC
Frequency range: 29-54, 118-175, 406-512, 806-950 MHz.
The *Regency* TS2 scanner lets you monitor Military, Space Satellites, Government, Railroad, Justice Department, State Department, Fish & Game, Immigration, Marine, Police and Fire Departments, Aeronautical AM band, Paramedics, Amateur Radio, plus thousands of other radio frequencies most scanners can't pick up. The *Regency* TS2 features new 40 channel per second *Turbo Scan*™ so you wont miss any of the action. Model **TS1-SA3** is a 35 channel version of this radio without the 800 MHz. band and costs only $219.95.

Regency® RH256B-SA

List price $799.95/**CE price $329.95/SPECIAL**
16 Channel • 25 Watt Transceiver • Priority
The *Regency* RH256B is a sixteen-channel VHF land mobile transceiver designed to cover any frequency between 150 to 162 MHz. Since this radio is synthesized, no expensive crystals are needed to store up to 16 frequencies without battery backup. All radios come with CTCSS tone and scanning capabilities. A monitor and night/day switch is also standard. This transceiver even has a priority function. The RH256 makes an ideal radio for any police or fire department volunteer because of its low cost and high performance. A *60 Watt* VHF 150-162 MHz. version called the **RH606B-SA** is available for $429.95. A UHF 15 watt, 10 channel version of this radio called the **RU150B-SA** is also available and covers 450-482 MHz. but the cost is $419.95.

★★★ Uniden CB Radios ★★★

The *Uniden* line of Citizens Band Radio transceivers is styled to compliment other mobile audio equipment. Uniden CB radios are so reliable that they have a two year limited warranty. From the feature packed PRO 810E to the 310E handheld, there is no better Citizens Band radio on the market today.

PRO310E-SA *Uniden* 40 Ch. Portable/Mobile CB ... $85.95
PRO330E-SA *Uniden* 40 Ch. Remote mount CB ... $109.95
NINJA-SA PRO310E with rechargeable battery pack. $99.95
B-10-SA 1.2V AA Ni-cad battery for Ninja (set of 10) ... $20.95
KARATE-SA *Uniden* 40 channel rescue radio $69.95
PRO510XL-SA *Uniden* 40 channel CB Mobile $49.95
PRO520XL-SA *Uniden* 40 channel CB Mobile. .. $59.95
PRO540E-SA3 *Uniden* 40 channel CB Mobile..... $97.95
PRO640E-SA3 *Uniden* 40 channel SSB CB Mobile... $137.95
PRO710E-SA *Uniden* 40 channel CB Base..... $119.95
PRO810E-SA *Uniden* 40 channel SSB CB Base ... $179.95

★★★ Uniden Radar Detectors ★★★

Buy the finest *Uniden* radar detectors from CEI today.
RD7-SA3 *Uniden* visor mount radar detector $99.95
RD9-SA3 *Uniden* "Passport" size radar detector ... $114.95
RD9XL-SA3 *Uniden* "micro" size radar detector ... $144.95
RD25-SA3 *Uniden* visor mount radar detector $54.95
RD500-SA3 Uniden visor mount radar detector.... $74.95

Bearcat® 200XLT-SA3

List price $509.95/**CE price $279.95**
12-Band, 200 Channel • 800 MHz. Handheld Search • Limit • Hold • Priority • Lockout
Frequency range: 29-54, 118-174, 406-512, 806-956 MHz. Excludes 823.9875-849.0125 and 868.9875-894.0125 MHz.
The *Bearcat* 200XLT sets a new standard for handheld scanners in performance and dependability. This full featured unit has 200 programmable channels with 20 scanning banks and 12 band coverage. If you want a very similar model without the 800 MHz. band and 100 channels, order the **BC100XLT-SA4** for only $194.95. Includes antenna, carrying case with belt loop, ni-cad battery pack, AC adapter and earphone. Order your scanner now.

Bearcat® 800XLT-SA

List price $549.95/**CE price $259.95/SPECIAL**
12-Band, 40 Channel • No-crystal scanner Priority control • Search/Scan • AC/DC
Bands: 29-54, 118-174, 406-512, 806-912 MHz.
The Uniden 800XLT receives 40 channels in two banks. Scans 15 channels per second. Size 9¼" x 4½" x 12½." If you do not need the 800 MHz. band, a similar model called the **BC210XLT-SA** is available for $196.95.

Bearcat® 145XL-SA

List price $189.95/**CE price $98.95/SPECIAL**
10-Band, 16 Channel • No-crystal scanner Priority control • Weather search • AC/DC
Bands: 29-54, 136-174, 406-512 MHz.
The *Bearcat* 145XL is a 16 channel, programmable scanner covering ten frequency bands. The unit features a built-in delay function that adds a three second delay on all channels to prevent missed transmissions. A mobile version called the **BC560XLT-SA** featuring priority, weather search, channel lockout and more is available for $98.95. CEI's package price includes mobile mounting bracket and mobile power cord.

Regency® Informant™ Scanners

Frequency coverage: 35-54, 136-174, 406-512 MHz.
The new *Regency* Informant scanners cover virtually all the standard police, fire, emergency and weather frequencies. The **INF1-SA7** is ideal for truckers and is only $149.95. For base station use, the **INF5-SA7** is $94.95. *With the purchase of any other scanner in this ad however, you can get the unique INF5-SA7 for only $79.95. Wow! What a deal.*

NEW! President® HR2510-SA

List price $499.95/**CE price $239.95**
10 Meter Mobile Transceiver • Digital VFO Full Band Coverage • All-Mode Operation Backlit liquid crystal display • Auto Squelch RIT • Preprogrammed 10 KHz. Channels
Frequency Coverage: 28.0000 MHz. to 29.6999 MHz.
The *President* HR2510 Mobile 10 Meter Transceiver made by Uniden, sets a new standard in amateur radio communications. Fully Features– The HR2510 has everything that you need. Up to 25 Watt PEP USB/LSB and 25 Watt CW mode. Noise Blanker. PA mode. Digital VFO. Built-in S/RF/MOD/SWR meter. Channel switch on the microphone, and much more! The HR2510 lets you operate AM, FM, USB, LSB or CW. The digitally synthesized frequency control gives you maximum stability and you may choose either pre-programmed 10 KHz. channel steps, or use the built-in VFO for steps down to 100 Hz. There's also RIT (Receiver Incremental Tuning) to give you perfectly tuned signals. With receive scanning, you can scan 50 channels in any one of four band segments to find out where the action is. Order your HR2510 from CEI today.

BC760XLT
800 MHz. mobile scanner
Only $279.95

★★★ Uniden Cordless Phones ★★★

A major consumer magazine did a comparison study on cordless phones. The check points included clarity, efficiency and price. *Uniden* was rated best buy.

XE700-SA *Uniden* Cordless Phone with speaker ... $114.95

★★★ Extended Service Contract ★★★

If you purchase a scanner, CB, radar detector or cordless phone from any store in the U.S. or Canada within the last 30 days, you can get up to three years of extended service contract from Warrantech. This service extension plan begins *after* the manufacturer's warranty expires. Warrantech will perform all necessary labor and will not charge for return shipping. Extended service contracts are not refundable and apply only to the original purchaser. A two year extended contract on a mobile or base scanner is $29.99 and three years is $39.99. For handheld scanners, 2 years is $59.99 and 3 years is $79.99. For radar detectors, two years is $29.99. For CB radios, 2 years is $39.99. For cordless phones, 3 years is $34.99. Order your extended service contract today.

OTHER RADIOS AND ACCESSORIES

BC55XLT-SA *Bearcat* 10 channel scanner $114.95
BC70XLT-SA *Bearcat* 20 channel scanner..... $169.95
BC175XLT-SA *Bearcat* 16 channel scanner..... $156.95
***NEW!* BC560XLT-SA** *Bearcat* 16 channel scanner... $98.95
***SPECIAL!* HX1500-SA3** *Regency* 55 ch. scanner... $169.95
MT5100 PLUS-SA *Regency* marine transceiver ... $134.95
R1090-SA *Regency* 45 channel scanner $119.95
UC102-SA *Regency* VHF 2 ch. 1 Watt transceiver ... $117.95
BPS5-SA3 *Regency* 16 amp reg. power supply... $179.95
MA549-SA3 Drop-in charger for HX1200 & HX1500 ... $59.95
MA518-SA Wall charger for HX1500 scanner $14.95
MA553-SA Carrying case for HX1500 scanner $19.95
MA257-SA Cigarette lighter cord for HX12/1500 ... $19.95
MA917-SA Ni-Cad battery pack for HX1000/1200 ... $34.95
BP205 Ni-Cad battery pack for BC200/BC100XLT... $49.95
B-8-SA 1.2 V AA Ni-Cad batteries (set of eight) $17.95
FB-E-SA Frequency Directory for Eastern U.S.A. $14.95
FB-W-SA Frequency Directory for Western U.S.A. ... $14.95
ASD-SA Air Scan Directory $14.95
SRF-SA Survival Radio Frequency Directory..... $14.95
TSG-SA "Top Secret" Registry of U.S. Govt. Freq.... $14.95
TIC-SA Techniques for Intercepting Comm..... $14.95
RRF-SA Railroad frequency directory $14.95
EEC-SA Embassy & Espionage Communications ... $14.95
CIE-SA Covert Intelligenct, Elect. Eavesdropping ... $14.95
MFF-SA Midwest Federal Frequency directory $14.95
A60-SA Magnet mount mobile scanner antenna... $35.95
A70-SA Base station scanner antenna..... $35.95
USAMM-SA Mag mount VHF ant. w/ 12' cable..... $39.95
USAK-SA ¾" hole mount VHF ant. w/ 17' cable.... $35.95
USAK450-SA ¾" hole mount UHF ant. w/ 17' cable... $35.95
Add $4.00 shipping for all *accessories* ordered at the same time. Add $8.00 shipping per radio and $4.00 per antenna.

BUY WITH CONFIDENCE

To ***get the fastest delivery from CEI*** of any scanner, send or phone your order directly to our Scanner Distribution Center.™ Michigan residents please add 4% sales tax or supply your tax I.D. number. Written purchase orders are accepted from approved government agencies and most well rated firms at a 10% surcharge for net 10 billing. All sales are subject to availability, acceptance and verification. All sales on accessories are final. Prices, terms and specifications are subject to change without notice. All prices are in U.S. dollars. Out of stock items will be placed on backorder automatically unless CEI is instructed differently. A $5.00 additional handling fee will be charged for all orders with a merchandise total under $50.00. Shipments are F.O.B. CEI warehouse in Ann Arbor, Michigan. No COD's. Most items listed have a manufacturer's warranty. Free copies of warranties on these products are available by writing to CEI. Non-certified checks require bank clearance. Not responsible for typographical errors.

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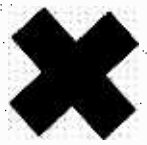
LETTERS



Not a Good Idea

A kick in the teeth to author Jack Buzby for his article *Live and Let Live* [May, 1988]. I'm really quite disturbed by the fact that Mr. Buzby would take four paragraphs to tell us that the Red Cross really doesn't want you to listen to their two-way communications and then, in the next breath, go on to tell us how to tune them in! My God! The Red Cross has done so much for man. Can't we just let them "Live and let live"? Let's have a little respect.

Kenneth Hodges
Orlando, Florida

On Losing the Right to Listen

Isn't it interesting how the phenomenon of "radio censorship" is progressing in the United States? First, we are ramrodded with the Electronic Communication Privacy Act. This, in turn, scared the scanner industry into producing receivers with missing or "locked out" frequency coverage.

Indeed, the future of full-coverage radio equipment is beginning to look bleak. Now, the Federal Communications Commission has decided that the citizenry is no longer allowed to buy or possess externally-programmable transceivers, either. What will be next? The right to *own* an all-band receiver?

Larry Wiland
Youngstown, Ohio

How about a license fee or tax on every receiver purchased? -- Ed.

Isn't it kind of ironic? Just as the Russians are getting more freedom under *glasnost*, we are losing ours under laws like the Electronic Communication Privacy Act?

Ken Courtland,
San Jose, California

You know, it always made me kind of sad to hear that manufacturers blocked out certain frequencies on receivers destined for places like West Germany. "These people aren't really free," I would think to myself. Neither are we, it now seems.

Albert Holl Jr.
Los Angeles, California

Be sure to see Bob Grove's revealing editorial on this subject on page 96 of this issue. -- Ed.

Realistic Story

I thought you might be interested in hearing some comments on the Realistic PRO-2004 from someone "down under." When the '2004 was released here in Australia, I asked by local Tandy store manager if I could try one out.

My main listening in the VHF/UHF region is police and fire (both of which have extensive repeater coverage) and I already own an AR-2001 25-550 MHz scanner which picks up them up quite well on its inbuilt antenna. The same stations hardly came in on the '2004. Needless to say, I returned the '2004 for a refund.

Recently, Tandy had a sale on the PRO-2021, selling the unit for $349.00. (That's $200.00 off). So I decided to purchase one. This set is great and equals my AR-2001 in receiving.

The moral: The best and most expensive receiver is not necessarily the one that's best for your location or need.

Stephen Newlyn
Elizabeth Downs, South Australia

In past issues, several readers have suggested ways to modify Radio Shack scanners so that they operate at higher scanning rates. The modifications for the PRO-2004 and '2003 were fantastic and were very easy to complete. However, the modification for the handheld scanner was nothing less than a disaster.

Some suggestions come to mind. First, all modifications should be checked for side effects. A mod that increases scanner speed but locks out the keyboard is of no use to anyone. Second, on circuitry that is smaller than 1/4 watt resistances, you need more expertise and better tools than most of us have. Readers should be warned of this. Perhaps some indication of level of difficulty might be included with each modification that you print.

Mark Swarbrick
Thorndale, PA

Way back in the December 1987 issue of *Monitoring Times*, you stated that the *MT* information network had learned that ICOM was expected to announce a follow-up to their R7000. In fact, there were to be three new receivers. Well, a handful of months have gone by and I'm still waiting to find out what else you've learned. Please! Don't keep us in suspense!

David Branscome
Newark, Ohio

We still hear hints of the ICOM, receiver number one, but no model number yet. In any case, their new 781 transceiver has stolen the show. The Sony 350 is also a question and a lot of us wonder if it is really a viable consumer product and not simply a technology showpiece. The third receiver, of course, is the Grove SR-1000, details of which were revealed in the June 1988 issue. --Ed.

[More "letters" on page 92]

COMMUNICATIONS

Baby Monitor Brings Drug Bust

A couple who heard a drug deal being described over the FM monitor they used to listen for sounds in their baby's room, alerted police who later arrested three men.

Fraser, Michigan, police Lieutenant Carl Smith said the suspects were arrested after they gave their address and telephone number while ordering a pizza over a cordless phone. The cordless phone happened to be transmitting on the same frequency as the couple's baby monitor. Eighty pounds of cocaine was seized in the resulting raid.

Free Interference Pamphlet

The FCC, together with the Electronics Industries Association, has completed the publication of a pamphlet entitled, *Consumers Should Know About Interference.* The booklet is designed to assist consumers in the identification and resolution of common problems with interference to home electronics products such as VCRs, TV sets, electronic musical instruments and cordless telephones. Copies are available from the Executive Director for Consumer Affairs, Electronics Industries Association, 2001 Eye Street NW, Washington, DC 20006. Please tell them that you read about it in *Monitoring Times.*

Tales of Radio Marti

John Cardinal O'Connor recently returned from a visit to Cuba, reportedly amazed by the effectiveness of the Voice of America's anti-Cuban Radio Marti. "Driving back from the Santiago Cathedral to the retreat house where we were staying, I asked the priest at the wheel about the throngs in church that night. In a land where the press is so completely controlled by the government I asked, 'how did so many people know about the mass?' 'Radio Marti,' answered the priest."

O'Connor also returned from the trip with a joke that reflects the station's reputation for knowing everything going on in Cuba. It goes something like this: Fidel Castro and his brother Raul are hunting deep in the woods. Raul bending over, tears his trousers. He remembers seeing a cabin a couple of miles back, and walks toward it to see if the people there can help him repair the damage. When he arrives, he sees a man already standing in the doorway, needle and thread in hand.

"Incredible!" exclaims Fidel.

"Not at all," the man answers. "I heard about it on Radio Marti!"

We don't make 'em up. We just report them.

GMT for Sale

Herstmonceaux Castle, home of the Royal Greenwich Observatory, which kept GMT time for the world for over a century, is now for sale. Asking price: somewhere between 11.2 and 18.7 million dollars. The observatory's new owners will get everything -- including a reputed ghost -- except for the telescopes and brass strip marking the prime meridian.

Ham Naked

Ever notice the Ham-ad in the back of *QST* magazine every month by K4NBN ("No Bad News")? Who is this guy?

We've listened to Del's antics on 20 m SSB during lunch hours at the club station here during work.

This guy has a whole routine, which includes his description of running 2 watts to a 1600 foot barbed wire antenna strung over a swamp in Razorville, Florida. He says he's 89 years old and lives in a trailer with his goat and his 643 pound wife, Magnolia Blossom, a 20-year-old who runs Del's nudist colony.

When working W1 stations, Del tells them he's had no visitors since "the bridge washed out two years ago" and he's so lonely that he'll even talk to "Yankees."

Del talks about eating chicken necks and rice on Saturday mights and possums and greens the rest of the week. During one QSO, he complained that the weather was so hot that he had to put his goat on the roof of his trailer to avoid the smell. In the middle of that QSO, he had to QRT suddenly because his goat fell off the roof.

The strangest part of his routine is when he offers to respond to your QSL with a picture QSL of his naked 643 pound wife, Magnolia Blossom. First, Del makes you swear that you don't have a heart condition. Then he warns you that he's given heart attacks to three hams who received his QSL. Says he's being sued by one's widow but that his lawyer says he'll win.

Is this a put on? Does he really send out a naked picture of his Magnolia Blossom? We worked Del from WA9WSL (Bell Labs Indian Hill club station) and sent our club QSL with a self addressed, stamped envelope. Sho' 'nuff, he sent us four copies of his UNIQUE picture QSL card!

The card is for real.

The Voice Wants You

Running a 500 kw AM transmitter takes a special kind of expertise; expertise that engineers in the U.S., where maximum transmitter power is limited to 50 kwm don't often have. That's why the Voice has inaugurated a training program for field engineers. Applications are now being accepted and upon completion, graduates will be considered for career positions in the U.S. Foreign Service. In this capacity, they will serve at the agency's overseas transmitting facilities.

For more information, write to the VOA Personnel Department, Technical Training Program for Field Engineers, Room 1543, 330 Independence Ave. S.W., Washington, DC 20547.

Stats on AM Radio

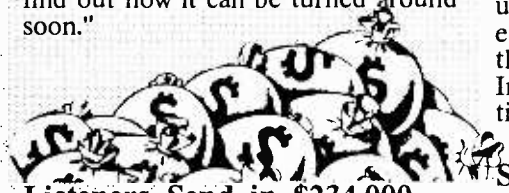
According to a Seattle-based organization called The Research Group, these are troubled times

COMMUNICATIONS

indeed for AM radio. Consider that only three of every ten radio listeners tune in to the AM band and that 1987 local and national advertising sales were about $2 billion for AM stations compared with $4.9 billion for FM.

Eighty-five percent of AM stations held steady or dropped in value in the last three years and three out of four large-city stations and about half of those in smaller markets make no money.

Says Bill Moyes, chairman of The Research Group, "It's going to be an irreversible trend if we don't move to find out how it can be turned around soon."



Listeners Send in $234.000-- for Nothing

Listeners to Ron Chapman's KVIL-FM radio show have "flabbergasted" the station's staff after the DJ asked them to send in $20.00 -- for nothing. Already, some $234,000 has come in. Chapman asked listeners to send in the money without telling them what he was going to do with it.

"We never promised anybody anything," said Chapman.

The day after his first request, 4,000 checks for $20.00 came in the mail. The following Monday, an additional 5,000 checks arrived.

The station has not decided what to do with the money but is keeping everyone's name and address on file. "People have been angry," says Chapman, "but it's because we won't let them send in more." Says FCC Mass Media Division supervisor of investigations Ralph Blumberg, "There's nothing wrong with saying, 'Send us your money.'"

Hijacker Frequency

Last month we told you how the terrorists aboard the hijacked Kuwaiti jetliner back in April used radio to confuse and confound negotiators and reporters. Dave Alpert of New York forwards information on at least one of the frequencies used: 118.70. File it for future activities of this kind, more of which will undoubtedly occur.

One Millionth Cellular Antenna Produced by Antenna Specialists

The Antenna Specialist Company recently celebrated the production of its one millionth cellular antenna, a milestone in the cellular communications industry. The antenna, model APD852.3, rolled off the assembly line earlier this year. It was greeted with cheers and celebration by A/S employees and management.

The antenna will be showcased, along with the first cellular antenna used in the Chicago AMPS tests in the early 1970s -- also made by A/S -- at the mid-year Telocator Show and International Mobile Communications EXPO 88.

System to Work Where Cellular Phones Fail

Hughes Communications and seven other companies have formed a consortium to build a $730 million satellite system that could make voice and data communications possible to and from trucks and cars virtually anywhere in North America.

The joint operating agreement marks the final step in seeking FCC approval for the system, which could begin operating in January, 1990. The FCC decision is expected late this year.

The system would involve putting terminals on the dashboards of cars and trucks and antennas on their roofs, allowing drivers to communicate with anyone else with a telephone via a three-satellite system. As much as 85 percent of the United State lies outside the coverage of ordinary cellular phones.

"CQ Burger King"

In issues past, *MT* has reported on the frequencies used by MacDonald's restaurants for window service. These frequency pairs are typically 154.60/35.02 MHz and 154.57/170.245 MHz.

Now a Burger King employee in Miami reports that his fast food chain uses 457.5625 (clerk) and 467.7875 (customer). Not only that, but Burger King utilizes CTCSS (tone squelch), 103.5 Hz.

The FCC authorizes a number of frequencies for wireless microphone use including those above and 169.445, 169.505, 170.305, 171.045, 171.105, 171.845 and 171.905 MHz.

Uniden Today

With the completion of a new 250,000 square foot facility in Dallas, Texas, the corporate and sales offices of Uniden Corporation of America will have moved there by the time you have this month's copy of *MT* in your hands. The new facility will manufacture not only scanners, but cellular telephones as well -- a $100 million business for Uniden. Only the parts and service department will remain at the former Indianapolis location.

As signatory to the Cellular Telecommunications Industry Association (CTIA), originator of the controversial Electronic Communications Privacy Act (ECPA) of 1986 which forbids monitoring mobile telephones (among other services), Uniden was required by CTIA to delete cellular coverage from their scanners, according to Uniden spokesman Paul Davis.

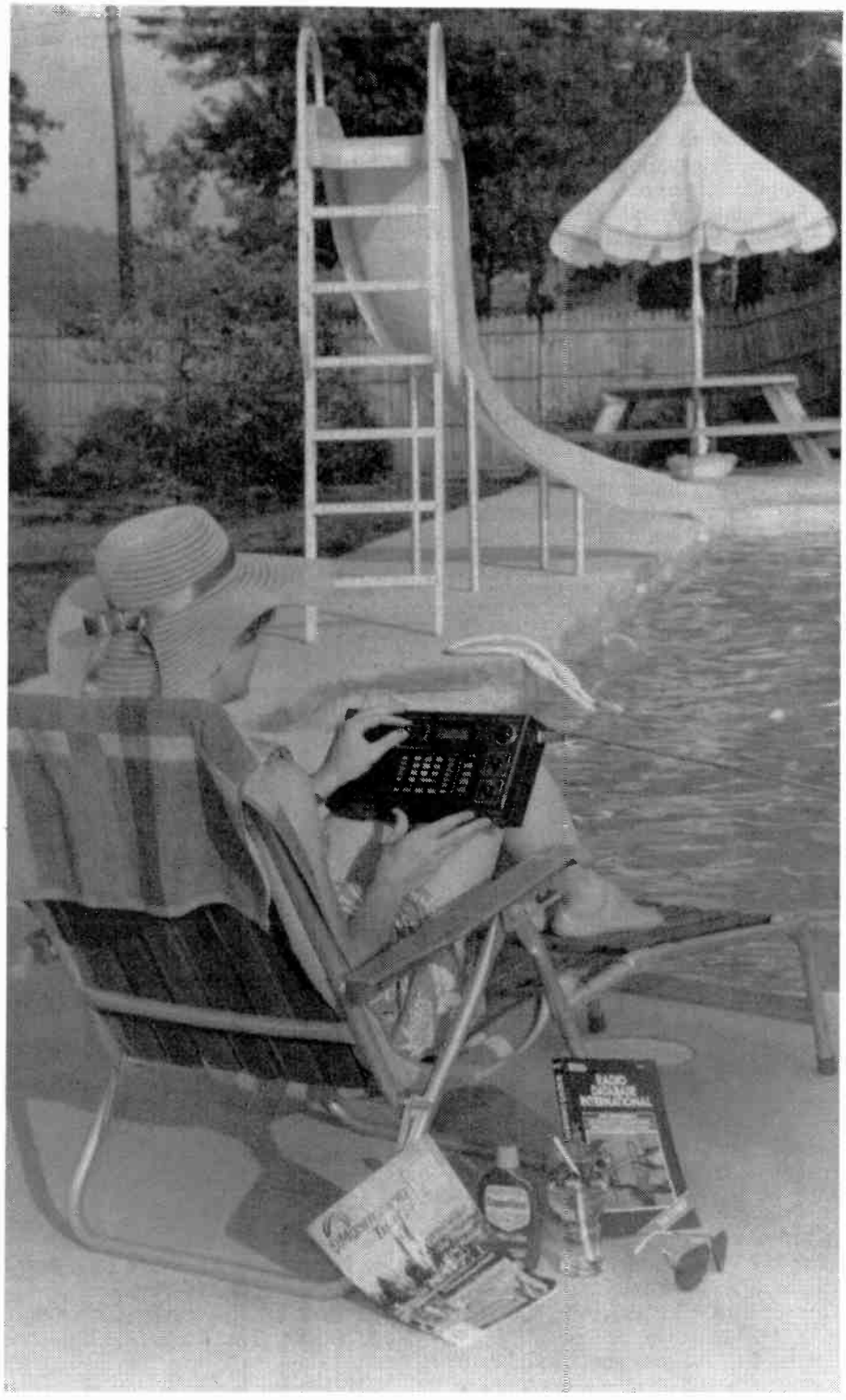
Asked by *MT* whether they would also delete conventional mobile telephone channels as well which are just as unlawful to monitor, Davis was unable to comment.

Uniden is actively resisting the restoration of cellular frequency coverage in those scanners in which such capability had been disabled at the factory, refusing to honor warranty service on altered units. For this reason, Grove Enterprises, which sells Uniden scanners and previously offered a cellular restoration service, has discontinued that option.

Still trying to reorganize Regency Electronics's consumer products division which they bought in the spring, Uniden will not be announcing any new scanner products at the June Consumer Electronics show in Chicago. There are some surprises, however, including the long-awaited BC-1000, scheduled for the winter show in Las Vegas. *(An exclusive MT report by Bob Grove)*

Credits: Associated Press via Dave Alpert and Dave Beauvais; *Broadcast Engineering*, *Catholic New York* via Ruth Hesch; *Los Angeles Times* via Rene Borde; *The Radio Enthusiast.*

Summer Listening,



myth *(mith) n. 1. A traditional story. 2. An imaginary or fictitious person, thing, event or story. 3. A false opinion, belief or ideal. [< LL mythos < Gk., word, speech, story]*

There are a few DXing and shortwave myths that seem to go on and on, reinforced not by fact but rather by regular telling. One of the most popular is that summertime is the worst time of the year to be listening to shortwave -- let alone trying to pick up any DX.

"Oh my goodness, it's true," lament the tribal storytellers, "there is *sooo* much static and noise that you might as well turn off the radio until after Labor Day." So goes the tale.

A Spillover from the Old Days

This kind of thinking is probably a spillover from broadcast band (AM) DXing, where summer months do bring with them exceptional amounts of static. Traditionally, the old dogs of AM DX would close up the shack on Memorial Day and not reopen it until the last hotdog rolled off the backyard grill in September.

For the shortwave listener, that old wive's tale is appropriate only to a much smaller degree. The serious listener, especially, will find much to attract him on the summer radio dials. Indeed, he may even find opportunities unavailable other times of the year.

Of course, it is true that static levels are higher on shortwave during the summer than during the winter. The only DX mediums that really thrive during this time of year are FM and TV DX.[1] But these high

. . . Summer Not

by John Bostick

shortwave static levels aren't always present. QRN-wise, the higher shortwave frequencies are generally quieter than such lower bands as 60 (4750-5060 kHz) and 90 (3200-3400 kHz) meters.

But even down on these lower reaches of the spectrum, there are nights -- yes, nights/plural -- during the summer when things are exceptionally quiet. Thus, the smart DXer will pull out his aural dipstick now and then, take a measurement and go after needed loggings if the readings look good. Never mind if it's summer or not!

Happy Ears and Successful DX

Keep in mind that the static irritation level can be alleviated somewhat if you use a sideband mode while tuning, even if broadcast-type signals are your target. You can also reduce QRN-caused wear and tear on your nervous system by taking more frequent breaks. Pull the headphones off and/or put the receiver into stand-by for five minutes out of every 20 or 30 when you're in the middle of a serious DXing session.

If your house isn't equipped with air conditioning, perhaps you can invest in a window model for your shack or at least bring a fan into service. That, plus comfortable attire and a long, cool drink should keep you going as you chase after a hot logging. Another good idea is to take the portable outside of the house. A few hours spent on a hillside, cool breeze blowing life into listener and radio alike, can be among the most pleasurable spent in pursuit of DX.

Beside the sometimes drop-off in static levels during the summertime, the warmer season actually seems to bring

[1] See the May, 1988 edition of *Monitoring Times* for more information.

To totally abandon your shortwave listening is to take a real chance of missing out on some unique listening and logging opportunities.

improved reception possibilities in several listening and DXing departments. The specific "whys" of these patterns aren't always known, but the reasons aren't real important to the pitch we're making for summertime listening anyway.

Improved Reception from Several Regions

For one thing, summer usually brings improved reception from stations broadcasting from the Pacific. You can generally look for better signals and more constant reception of such stations as the Soloman Islands Broadcasting Corporation (5020 and 9545), Radio Tahiti (6135, 11825 and 15170), the Cook Islands (11760) plus Radio New Zealand and the Australian regionals. If WSZO (4940) in the Marshall Islands is back on the air, summer is a good time to check for it.

There are a handful of nights every summer where reception of Latins seems enhanced, too. The DXer with an interest in tuning this area may be able to pull in signals from deep into the continent -- low powered stations in Peru and Bolivia, particularly. Improved signal strength may also be noted at time from the always sought-after Falkland Islands Broadcasting Station.

Some nights may see extra-strong signals from some of the African stations on 60 and 90 meters. Examples include Ghana (3366 and 4915), Namibia (3270 and 3290) and Trans World Radio-Swaziland on its several 90 and 60 meter band frequencies. Also, Uganda (5026), Zimbabwe (3306 and 3396), Tanzania (5050) and Zanzibar (3339), among others.

Higher Frequencies Hold Up Longer

Thanks to summer's long periods of daylight, the higher shortwave frequencies hold up further into the evening, even during years when solar activity is in the doldrums. Now, with solar activities on the rise and sunspots popping up all over, the higher bands have begun to show well late into the evening. During the last sunspot maximum, for example, 25 meter (11650-12050) reception was possible practically around the clock.

So, the summer months are great times to check for stations you want to hear on higher frequencies which have schedules that might not normally work for reception in your area during the winter. Needless to say, you should take advantage of these opportunities while they're with us.

High sunspot activities also mean the coming to life of the 21 MHz broadcast band. Some fun, if not exactly roller coaster-like thrills, may be had by following the activity up here in the shortwave stratosphere. There should be still more stations heading up this way in the next year or so. Signals on this band should also be better heard now than in winter.

Those who like to hunt or listen to sambas, soccer and such will find reception of the higher band Brazilians is also better during the summer, even in daytime. Such stations as Radio Cultura (9615), Radio Aparecida (9630), Radio Rio Mar (9695), along with 25 meter banders Radio Guaiba (11785), Radio Globo (11805), Radio Universo (11905), Radio Gaucha (11915) and Radio Clube Paranaense (11935) should be showing up soon. Even higher up, try Radio Clube Ribeirao Preto (15415) and Radio MEC (17875), along with a number of other stations that tend to cling to shortwave's roof.

Summertime Surprises, 1988!

This particular summer is also expected to see a few new arrivals on the shortwave bands, including the new religious broadcaster in Tennessee, WWCR, and the new Radio Australia transmitter site at Brandon. You'll want to watch for those and several other surprises which show on shortwave no matter what the season.

Certainly, the ham band DX listener needs to pay plenty of attention to DX matters during the summer. Since 20 meters is a prime DX band and is open much of the day and night during this time of year, there are DX opportunities galore. It is the wise man who gets the DX worm while it is there (Old Russian proverb).

Too, if you travel this summer on vacation, don't forget to take along the radio. A change in location can result in different reception conditions, even if you're only staying a hundred miles from the shack. Local man-made noise may be reduced, if you leave the city and the water we're all attracted to in the heat can make for better conditions as well. Bring along a good portable or pack the main rig and a handful of wire for an antenna and listen by the seaside!

Yes, we all welcome the summer months when they arrive. We all feel the magnetic pull of beaches, bikinis, beer, barbecues and baseball. Those -- especially those -- who suffer through miserable winter weather would never want to put those attractions aside and spend these months immersed in radio instead of a swimming pool. On the other hand, to totally abandon your shortwave listening and DXing is to take real chances of missing out on some listening and logging opportunities -- opportunities that may not exist at other times of the year.

So, unless you have a good portable and can sit in the backyard with a radio in one hand, a hotdog in the other and a beer between your legs, better plan to include a little shack time as part of your summer fun activities!

MT RIDES THE RAILS

A Return to the Glory of Steam

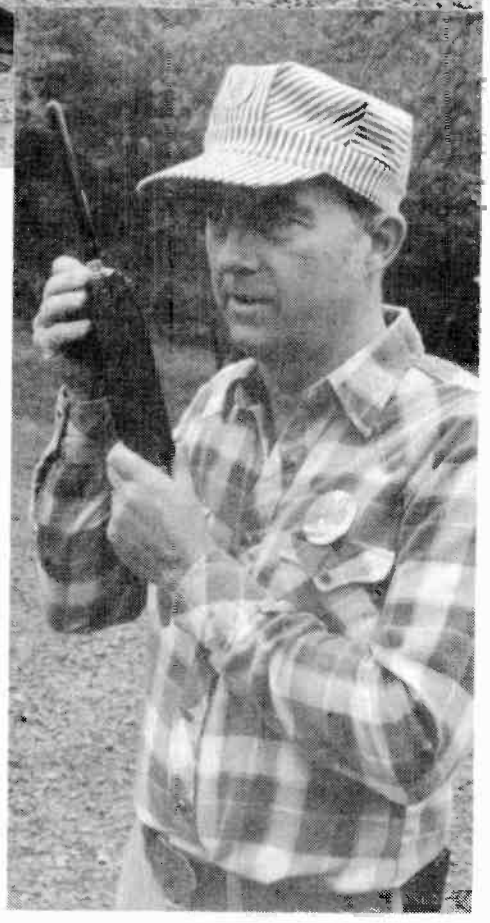
by "Engineer Bob" Grove, WA4PYQ

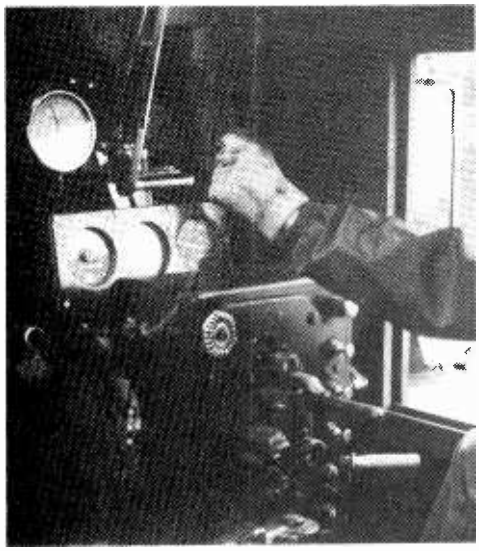
"Chug...chug....toot...toot" Old 1218, the only remaining member of Norfolk Southern's class A steam engine fleet, pulled away from the Asheville, North Carolina, depot and I was on board. The attachment I felt for that old steam locomotive was inexplicable. I listened to her whistle pierce the beautiful spring morning and watched through the window as others who had gathered to witness the historic trip cheered her on.

Tears welled in my eyes -- as they do again now in fond recollection -- and my heart swelled with pride as the old engine built up a full head of steam and the rhythm of her wheels echoed along the tracks. It brought back many pleasant memories of my childhood, racing alongside the old steamers that ran behind our home, playing in the giant puff of steam that cuddled me like a warm, soft blanket.

My pleasant memories were enhanced by the squeal of metal against metal, the familiar "clack-clack-clack" of a flat spot on a wheel rapping the track. It was comfortable and soft and friendly, and the other passengers in the pullman coach were clearly enjoying their nostalgic recollections as well.

Old 1218 is the largest operating steam engine in the world. Built in 1942 and retired from service in 1959, it was completely refurbished at the Birmingham, Alabama, yard at a cost estimated at $4 million. Her 6000 horsepower was now pulling 22 cars through the scenic western North Carolina mountains.





Frequency Allocations

U.S. and Canada share frequency allocations for the railroads. This comprehensive list will tell you where to look.

For additional information on obtaining complete guides, send an SASE and your request to the following publishers:

Pocket Guide to Railroad Radio Frequencies by Bruce K. Heald (annual), Johnson Mill Rd., North Branch, MI 48461

Compendium of American Railroad Radio Frequencies by Gary L. Sturm and Mark J. Landgraf (1987), 3 Coralberry Circle, Albany, NY 12203.

Canadian Railway Radio Guide by Kenneth A. W. Gansel (annual), P.O. Box 1108, Niagara-on-the-Lake, Ontario, Canada LOS 1JO

159.810	159.930	160.050	160.185	160.200	160.215	160.230	160.245
160.260	160.275	160.290	160.305	160.320	160.335	160.350	160.365
160.380	160.395	160.410	160.425	160.440	160.455	160.470	160.485
160.500	160.515	160.530	160.545	160.560	160.575	160.590	160.605
160.620	160.635	160.650	160.665	160.680	160.695	160.710	160.725
160.740	160.755	160.770	160.785	160.800	160.815	160.830	160.845
160.860	160.875	160.890	160.905	160.920	160.935	160.950	160.965
160.980	160.995	161.010	161.025	161.040	161.055	161.070	161.085
161.100	161.115	161.130	161.145	161.160	161.175	161.190	161.205
161.220	161.235	161.250	161.265	161.280	161.295	161.310	161.325
161.340	161.355	161.370	161.385	161.400	161.415	161.430	161.445
161.460	161.475	161.490	161.505	161.520	161.535	161.550	161.565

Thousands of railroad buffs of all ages had assembled across every highway, overpass, trestle, tunnel, crossing and depot along the way. We waved enthusiastically as our admirers snapped photos, took home movies and recorded us on video and audio cassette. Clearly, this historic trip would be well documented!

I had my Bearcat 100 searching between 160 and 162 MHz, home of railroad radio in the United States and Canada. The search sequence abruptly stopped on 160.950. "Steam Special to Asheville..we're on our way"!

Hand-held transceivers bristled from every belt as crew members walked from car to car, carefully checking all systems. The huge locomotive was to follow special rules because of its size; it had to move more slowly around curves and over trestles which slowed down its momentum. Old Fort hill would be the real trial.

Spanning several miles of verdant mountain valleys, the Old Fort incline was a test for any train. Old 1218 huffed and puffed (*"I think I can, I think I can"*) -- but started slowing down. Before we crested the top of the incline, we came to a complete halt.

"The wheels are slipping on the track," the engineer barked into his radio. "We're right behind you," came a reply. Sure enough, within minutes a spectacle of no fewer than five diesel engines hooked in tandem came around the lower curve into view. Concerned for her safety, they had been following the train -- just in case.

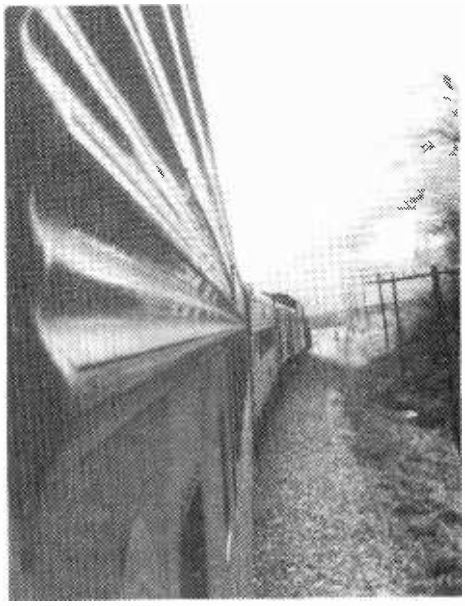
Cautiously approaching the rear of the train, the diesels coupled up. The gentle nudge was hardly noticeable. "Are you ready?" the diesel engineer radioed his partner on 1218. "Let 'er go!" Softly and slowly the train resumed its upward trek, occasionally punctuated by a jolt which was echoed by the sounds of metal.

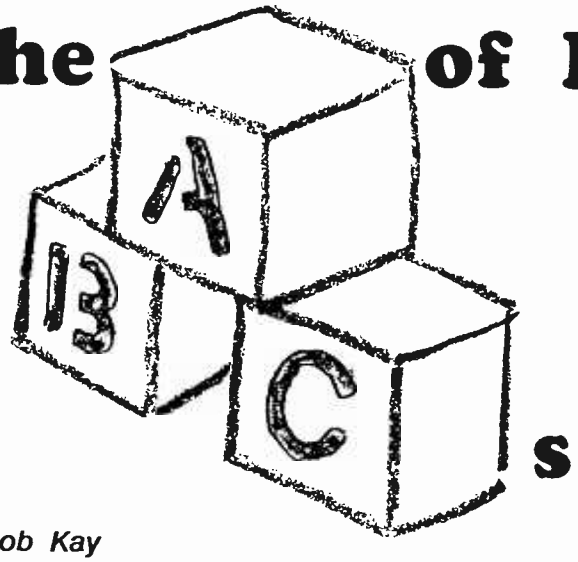
With our heads leaning out the vestibule doors, we could see the black plume of smoke belching from the stack on 1218. Contrasted against it in a clear, blue sky was the cloud of steam puffing from the engine. "We're on our own"; 1218 had crested the hill, the diesels pulled back and the glorious engine thundered proudly down the track...and into history.

"...Off we go."

mt

(Overleaf) On the move near Swananoa and Azalea, NC (courtesy of the Asheville chapter of the National Railway Historical Society). Mighty 1218 is admired by onlookers and shutterbugs, top left (photo by Jay Hensley, Asheville Citizen). All other photos by Bob or Judy Grove.



The  of Federal Scanning

by Bob Kay

Back a couple of years ago, a scanner buff wrote to *Monitoring Times* about an unexpected visit from some very unfriendly federal agents. It seems that Todd Shideler was using his scanner to provide news stories to a local TV station. The agents didn't like that. And they told him so.

What Mr. Shideler probably didn't know was that while the third party Communications Act of 1934 guarantees every citizen free access to the full radio spectrum, you're not supposed to repeat what you hear. The scanner buff, exercising his rights through the use of a scanner, risks nothing -- so long as the conversation being monitored is not repeated or used for personal gain.

Still, the Federal government really does not want you to listen, especially to "sensitive" transmissions. To discourage hobbyists, they may use Digital Voice Privacy (DVP). Designed by Motorola, DVP adds at least $1,000.00 to the cost of a radio. When monitored, it sounds like an increase in background noise. Voice patterns are not recognizable.

Fortunately, because of the high cost, only a few select radios actually have DVP. The remaining frequencies will usually be clear voice channels. (For a complete discussion of DVP, see Dave Jones' article, "Protecting Voice Transmissions" in the June 1988 edition of *Monitoring Times.*)

Aside from DVP, monitoring federal frequencies presents some very unique problems. Such transmissions, for example, are usually short and sporadic. Unless an actual "bust" is going down, don't expect the action to be similar to monitoring a metropolitan police department.

When a conversation is intercepted, understanding the content may require a little work. Some agents use their own private code words and to the casual listener, they may have little meaning, if any. How to decode? Start work when you happen to monitor a large "bust." Then read about the action in the paper the next day. Many agents that work in teams continually use the same code words. Only the operational name of each case is changed.

On the other hand, there are some agents that don't seem to be the least concerned about unwanted listeners. Monitoring these communications can be quite exciting. Following the action through the streets of a city can be accomplished with nothing more than a road map!

Generally, the actual bust, whether it involves one individual or an entire corporation, will be carried out on a "tactical frequency." Agents working in a team will often use radios with multichannel compatibility. Frequency separation on these channels rarely exceeds a one megahertz step. So, if a transmission is heard on 164.0 MHz, the other available channels will most likely fall between 164.0 and 165.0 MHz.

Discovering these frequencies is simply a matter of searching the upper and lower limits of the band being monitored. Specific search limits are as follows: 148-150.8, 163-164, 167-168, and 410-420, with particular emphasis given to 418-419 MHz.

For example, over the next few months that traditional American spectacle, the race for the presidency, will reach a fevered pitch. While the field of candidates has been whittled down to three, those that remain will be even more active. And, as you might guess, the Secret Service is never far behind them, wherever they go. If a candidate does visit your area, be sure to listen in on the following frequencies: 165.375, 165.7875, 166.5125, 166.7, 167.025, 169.625 and 169.925.

Another interesting but often overlooked federal target is surveillance transmitters, or "bugs" as they are more commonly known. Attached to a suspect or planted in a room or on a vehicle, a bug is a miniature transmitter that may send a homing beacon. Others transmit the actual voice of the carrier and those around him.

The signals from mobile bugs or "bumper beepers" may travel several miles. Body bugs, either on the agent or on the suspect, usually transmit only within a few hundred feet or so.

In the race for the presidency, formerly quiet Secret Service frequencies will come alive with activity.

As a result, the scanner buff is most likely to hear a room bug that has been placed in an apartment building or hotel. A directional mobile receiving station would definitely be a help in this type of scanning. Be warned, however: bug scanning can be dangerous. Simply being able to monitor a bug suggests that you are dangerously close to an operation that may be life threatening!

The more popular bugging frequencies are found in the following ranges: 88-115, 72-76, 30-50, and 150-174. Again, if a bug should be discovered, exercise extreme caution. You're playing with the big boys!

Federal agents have also been monitored on frequencies that were borrowed from local business establishments. If your area has a taxi cab or construction company that signs off the air at night or on weekends, these frequencies could become targets for federal use. It would then become quite possible to hear security for an upcoming special event on a business frequency in the 463.0 MHz range -- or practically anywhere else!

To discover these "hidden" frequencies, just make a careful list of services in your area that become inactive at night or during the weekend. Also list those frequencies that experience light traffic during the day. Then, when the action comes to town, check out your "inactive list." You may be surprised.

Top Ten Federal Scanner Frequencies

The spectrum above 30 MHz is saturated with two-way intrigue -- if you know where to look. All voice transmissions are in narrowband FM.

34.83	Fish & Wildlife
122.9	Gov't aircraft
163.200	U.S. Marshal
165.2875	ATF
165.375	Secret Service
165.950	IRS
167.050	FCC
167.5625	FBI
415.700	Air Force One
417.200	Fed Protection service

(Photo courtesy Fairbanks Daily News-Miner; Barbara Kelly, photographer)

Intriguing communications are not always confined to familiar parts of the spectrum. From time to time, reports are heard of two-way Department of Energy communications being conducted in the 118-136 MHz aircraft band. There have even been reports of NSA or CIA links occupying the 400-406 MHz block and FM ground communications near the upper edge of the 225-400 MHz military aircraft band.

While this is in direct conflict with the U.S. band plan agreement, not only between the FCC (who manages civilian licensees) and IRAC (the Interdepartment Radio Advisory Committee who rides herd on federal assignees), but international agreement as well, it does help camouflage sensitive communications.

Another curious inhabitant of the AM aircraft band is the occasional air-to-ground transmission of a federal law enforcement surveillance aircraft. Most often, the transmissions will be a blend of conventional VHF-FM 162-174 MHz assignments and 118-136 MHz AM traffic.

Normal aircraft chatter is channelized every 25 kilohertz. Federal agencies are most often found between 122 and 124 MHz (as are civilian communications). Hijack communications are also conducted here; each major airport has one common frequency which is cleared for emergency FBI communications with the aircraft during these crisis situations.

So don't limit your monitoring of federal bands to just the law enforcement branch. Plenty of action can be found DXing the forestry service, park service, environmental agencies, prisons, wildlife biologists, and hundreds of others. Just pick your own area of interest and pursue it. If further assistance is needed in any area, there's an entire staff of *Monitoring Times* writers willing to help you.

mt

Exclusive Federal Government Frequency Ranges (MHz)

29.9-30.55
32.01-32.99
34.01-34.99
36.01-36.99
38.27-38.99
40.01-41.99
46.61-46.99*
49.61-49.99**
162.025-173.2
173.4125-173.9875
225-400
406.125-419.99375

* *Shared with cordless phones*
** *Shared with cordless phones, cordless headsets, walkie-talkies*

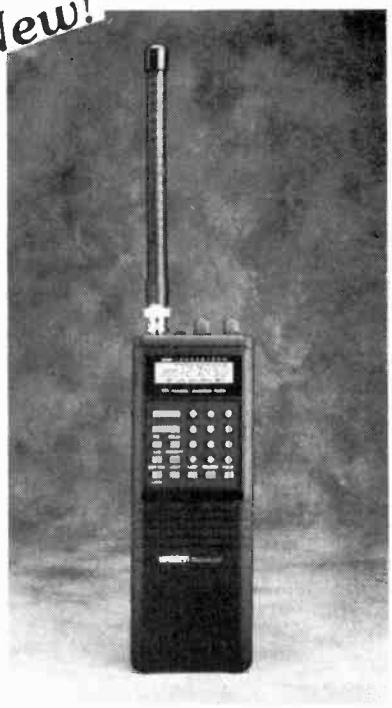
Air Force One is not the only federal user of both the 118-136 MHz civilian and 225-400 MHz military aircraft bands.

Walk Tall and Carry a Little 'Bear'

Grove has super deals on Bearcat's exciting new handhelds, with more memory channels and wider range than ever before!

Bearcat BC200XLT

New!



Finally, a high performance handheld programmable scanner which includes aircraft and all land mobile bands, including 800 MHz!

Frequency coverage is 29-54, 118-174, 406-512, and 806-960 MHz (less cellular frequencies, which we can restore for $10 at time of order). 200 memory channels may be stored in 10 banks of 20 channels each or scanned sequentially.

This feature-packed handful offers ten priority channels, search, lockout, and delay and comes equipped with detachable Nicad battery pack, AC charger, leather holster, and BNC flex whip.

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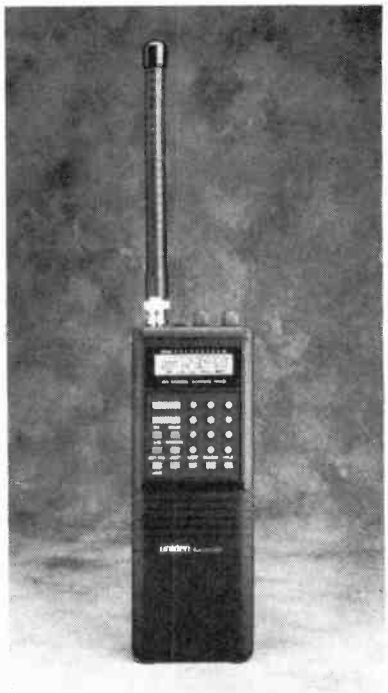

The Bearcat BC100XLT

Introducing the **BC-100XLT**, with 100 memory channels! Yes, the all-time popular Bearcat hand-held programmable scanner has aircraft reception, 100 channel memory, illuminated LCD display for night viewing, search, rapid scan (15 channels per second), direct channel access, lockout, delay, low battery indicator, priority, and keyboard lock.

Frequency coverage is 29-54, 118-174, 406-512 MHz. Accessories included: Rubber ducky antenna (with BNC base), AC adaptor/charger, Nicad batteries, earphone, and carrying case.

Handsome black case with white chrome accents.
Dimensions: 7½"H x 2⅜"W x 1⅜"D; Weight: 2 lbs., 10 oz.

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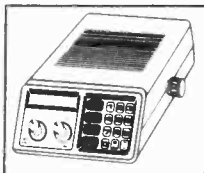

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—SCANNER WORLD EXCLUSIVE—

Features include simple programming of the following frequency ranges: 30-50 MHz, 144-174 MHz, 440-512 MHz. Digital display, priority, search, lockout, delay, dim control, top mounted speaker, one year factory warranty. Includes AC & DC cords, mobile mounting bracket, telescopic antenna. All for only **$169.99** plus $7.00 shipping (optional extended warranty: 3 years $39.99; 2 years $29.99.) MX3000 Service Manual $5.00.

Regency® Z30

30 Channel Automatic Programmable Scanner

Scanner World Special

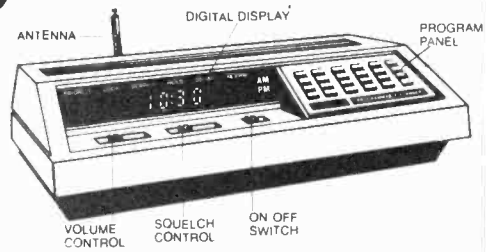
$129.99

(plus $7.00 shipping each)

Optional Accessories:

Cigarette Lighter Plug RGMPC . $4.95

Z Mobile Bracket — ***Special*** . . . $5.99



The Regency Z30 is a compact, programmable 30 channel, multi band, FM monitor receiver for use at home or on the road. It is double conversion, super heterodyne used to receive the narrow band FM communications in the amateur, public safety and business bands: 30-50, 144-174, and 440-512 MHz. Size 10¾"Wx2-7/8"Hx8-3/8"D.

Sophisticated microprocess-controlled circuitry eliminates the need for crystals, instead, the frequency for each channel is programmed through the numbered keyboard similar to the one used on a telephone. A "beep" acknowledges contact each time a key is touched. The Z30 scans approximately 15 channels per second.

Any combination of two to thirty channels can be scanned automatically, or the unit can be set on manual for continuous monitoring of any one channel. In addition, the search function locates unknown frequencies within a band.

Other features include scan delay, priority and a bright/dim switch to control the brightness of the 9-digit Vacuum-Fluorescent display. The Z30 can be operated on either 120 VAC or 12 VDC. Includes one year warranty from Regency Electronics (optional 3 yr extended warranty only $39.99, gives you a total of 4 yrs complete warranty or 2 yr extended warranty only $29.99, gives you a total of 3 yrs complete warranty.) Z-30 Service Manual $5.00.

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$209.99 *($7.00 shipping)*

100 channel pocket sized hand-held scanner (6"Hx1"Dx2¾"W), no crystal, portable scanner, 29-54 MHz, 118-174MHz, 406-512 MHz, bank scanning, backlit LCD display, automatic search, lockout, scan delay, priority, key lock, plus much more. Includes rubber antenna, rechargeable Ni-Cad battery pack, AC adapter charger, earphone, and carry case. optional cigarette lighter adapter #15MPC $12.99.

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REGENCY TS-1 Turbo Scan AC/DC	239.99	(7.00)
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REGENCY MA-549 Drop in charger for HX1000/1200	89.99	(5.00)
REGENCY MX-3000 AC/DC Digital Scanner	169.99	(7.00)
REGENCY Z-30 AC/DC Digital Scanner	129.99	(5.50)
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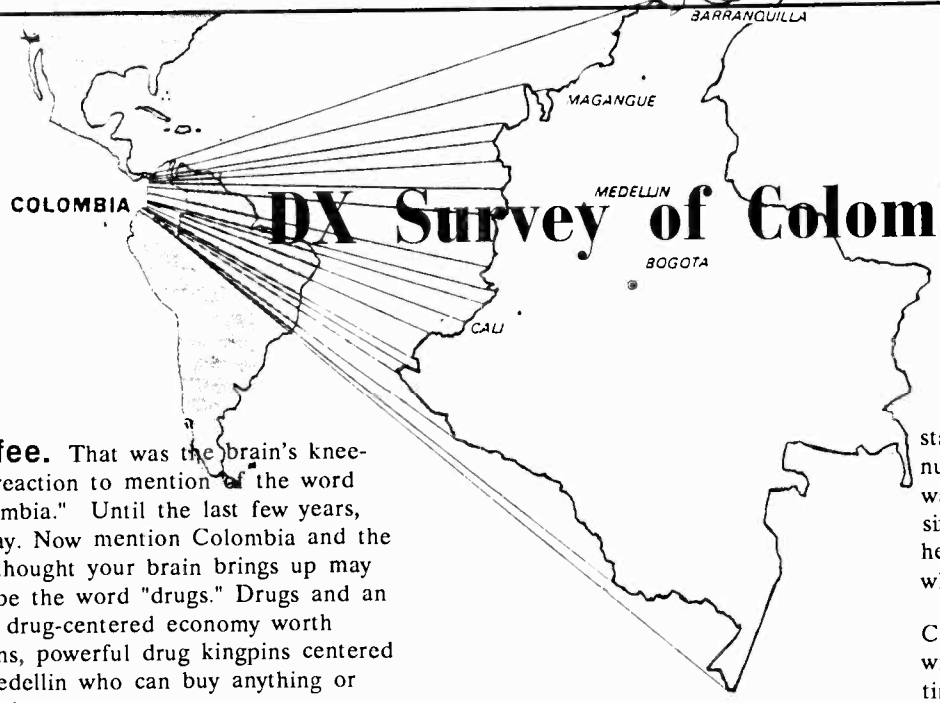


DX Survey of Colombia

by Charles Sorrell

Coffee. That was the brain's knee-jerk reaction to mention of the word "Colombia." Until the last few years, anyway. Now mention Colombia and the first thought your brain brings up may well be the word "drugs." Drugs and an illicit drug-centered economy worth billions, powerful drug kingpins centered in Medellin who can buy anything or anybody.

Cocaine and the trouble it has brought the Colombian government and ordinary citizens is just another item in a long history of torments through which Colombia has traveled.

Simon Bolivar won independence for Colombia in 1819. It was set up as the new nation of Greater Colombia, which included an administrative area set up earlier by the Spanish which covered Colombia, Panama and most of Venezuela. Bolivar's Greater Colombia added Ecuador to the territory. But the union soon fell apart and Colombia shrank to include only Panama (beyond what is Colombia today). Panama was lost to Colombia in 1903.

Liberals and conservatives in the political spectrum rarely agree on much of anything. In Colombia the two philosophies very often erupt into violence and death -- something which had been happening on and off since independence. Over 100 thousand people were killed in wars between the two factions around 1948 and the government imposed a state of siege which ended in 1982. Although things had begun to settle down in the 50s, the situation took another downturn in the 70s and hasn't improved any in the years since. At present, several leftwing Marxist groups are active within Colombia, including M-19 and FARC.

There are about 26 million residents of this, the only South American country with both Pacific and Caribbean coastlines. Panama, Venezuela, Ecuador, Peru and Brazil all share border areas with Colombia. Three Andean mountain chains march north into the country from Ecuador. To the east are the grasslands (llanos) and the tropical rainforests of the Amazon, which are mostly undeveloped.

Colombia on the Air

For the shortwave broadcast DXer, Colombia offers quite a choice of stations, and many of them quite easily received. There are, however, considerably fewer such stations today than there were even two or three years ago. About a dozen Colombian stations have left shortwave in the past two or three years although, typical of Latin America, one should never count them as permanently out of the game.

Most stations (at least those on shortwave) are members of a national network and network mentions are often heard. Caracol (Primera Cadena Radial Colombiana) is, overall, the largest network. Radio Cadena Nacional (usually announced by just the letters R-C-N) and Todelar (Circuito Todelar de Colombia) are about equal in size. The Super network has far fewer stations, though a disproportionate number of them are active on shortwave. Grupo Radial Colombiana is the sixth of the main networks. All are headquartered in Bogotá except RCN which is centered in Medellin.

Colombian shortwave broadcasters have widely varying sign on and sign off times and the schedule of broadcast hours can change widely at a particular station from day to day or week to week.

Identifications are often frequent but, again, it does vary from station to station. Those on the Super net often run long programming stretches from the network and the only ID during these is usually just a mention of "Super."

Tuning Times

The best times to tune for Colombian stations is in the evening from 0000 or 0100 until sign off, which can vary from as early as 0200 to not at all. Another opportunity window comes at 0900 when stations begin to sign on and lasts until propagation takes out the band or the QRM takes over. Note that nearly all of the Colombian stations are nestled in the 60 and 49 meter bands.

The Stations

Here's our *Monitoring Times* Colombian station list, showing all stations which have been active and logged in North America within the past few months:

4785 - Ecos del Combeima, HJLW at Ibaque uses 5 kilowatts and is a member of the Super network. It is not consistently active, however. The fre-

quency may vary, but usually less than one kilohertz.

4815 - Radio Guatapuri at Valledupar is a member of the Grupo Radial Colombiano network and has recently been reactivated, though it could also be off the air by the time this is read. HJKG seems to have a floating sign off - it may be 0300, 0400 or 0500.

4845 - Radio Bucaramanga. One of the more powerful Colombian shortwave stations (10 kw), HJGF from Bucaramanga is an old timer which has had long periods of inactivity on shortwave but keeps coming back. Usually an 0400 sign off and sometimes includes identifications in English.

4865 - La Voz del Cinaruco from Arauca runs 1 kilowatt and the frequency may vary a bit. It is a Caracol outlet and alternates between active and not. Call is HJLZ.

4875 - Radio Super de Medellin is, as you can see from the name, a Super network station, although the Medellin part of the ID is, often as not, omitted. HJGB runs 2 kw.

4885 - Ondas del Meta at Villavicencio has 5 kw and is a Super network affiliate. Sometimes operates 24 hours and sometimes it's not on the air at all! HJIG is the call.

4895 - La Voz del Rio Arauca, Arauca. This one is brand new on shortwave although its 1110 kHz mediumwave outlet has been around for some time. There's not a lot known about La Voz del Rio Arauca right now. Try for it around its 1000 UTC sign on but watch out for interference from Radio Bare in Brazil.

4915 - Armonia del Caqueta broadcasts from Florencia with three kilowatts. Recently noted with a 1000 sign on time.

4945 - Caracol Neiva, from Neive is nominally a 24 hour station but the 5 kw of HJDH aren't perking 'round the clock on a daily basis. A Caracol outlet, formerly Radio Colosal.

4975 - Ondas del Orteguaza at Florencia is a Todelar network member. The 1 kw transmitter of HJQA is often buried under a strong utility station but when the one is off and the other is on, the Colombian can be heard quite well. Recently observed at 0300 sign off.

5040 - Radio Cinco at Villavicencio is a member of Grupo Radial Colombiano and runs 2 kilowatts. In recent months it seems to have become inactive.

5050 - La Voz de Yopal from the city of that name is one of the more difficult Colombians to log. If nothing else, there are several others to contend with on this frequency. HJPV, a Todelar member, uses 1 kw. There's some confusion over just which network the station belongs to but it appears it may have recently switched from Caracol.

5095 - Radio Sutatenza at Bogota is a religious/cultural outlet running 50 kilowatts and is a surefire bet as the easiest Colombian to hear. For years it ran on this channel and 5075 in parallel but 5075 has recently had only occasional use. A listed 6075 is also only periodically active.

5353 - Ecos del Putamayo at Puerto Asis may be (or may have been) an unlicensed outlet. It has not been noted in some months and may have had a short career.

5566 - Radio Nueva Vida from Cucuta is a new entry which came on the air in 1987. A religious outlet with 500 watts, it has also been heard on 5533, 5530 and 5570. Not an easy log.

5955 - La Voz de la Centauros at Villavicencio. HJOQ is a Caracol member, runs 5 kilowatts and was recently noted to sign on at 0900.

5975 - Radio Macarena at Villavicencio sometimes signs on around 0900 and sometimes runs 24 hours. It's a Todelar outlet with 5 kw.

6015 - Radio Mira at Tumaco is a Caracol network member. HJOY runs 2.5 kilowatts but isn't often logged, due in part to consistent activity by other stations in this frequency area.

6035 - La Voz de Guaviare, San Jose de Guaviare carries Todelar programming on its 5 kw transmitter. Call is HJWA.

6045 - Radio Melodia in Bogota operates irregularly on shortwave but pumps out 5 kilowatts when it is on.

6065 - Radio Super, Bogota is listed for 24 hours but just as often isn't. HJAX has 5 kilowatts.

6085 - Ondas del Darien, from Turbe, has not been heard recently but it has a history of long silent periods so it's reasonable to expect it to show up again. HJTF is 1 kw.

6115 - La Voz del Llano, Villavicencio is a Super network member. HJIA's 2 kilowatt transmitter tends to wander up to 6116 or even 6117 but despite that fault, often puts in good signals.

6160 - Emisora Nueva Grenada at Bogota is the only RCN representative on shortwave. HJKJ has 10 kw and listings show a basically daytime only schedule, though it has been heard in the early mornings and evenings.

6170 - La Voz de la Selva, Florencia, is a Caracol representative running 1 kw. HJKF sometimes has stretches of inactivity on shortwave.

6350 - La Voz de Samaniego, Samaniego, is heard only rarely and may be an unlicensed station. WRTH lists the schedule as Thursday through Sunday from 2300 to 0030. Unheard in some months.

11795 - Radiodifusora Nacional de Colombia, Bogota, is the government station. It has a lot in common with its Venezuelan equivalent. It plays a lot of classical music, but isn't always active and its frequency is skittish - in this case 11739 was recently the spot. HJZM runs 25 kw.

Verifying

Colombian stations, in general, are fairly good verifiers (at least compared to the average in some other Latin countries).

Reception reports should be sent in Spanish and should include some form of return postage -- Colombian mint airmail stamps or International Reply Coupons.

With just a little more than normal effort you can hear and QSL most if not all of the active shortwavers so, why not go get 'em?

AGAINST ALL ODDS

by Wayne Mishler KG5BI

What was the identity of those two vessels, and were they really transmitting from the Persian Gulf? No one will ever know. At least, not these two city dwellers who leave the comforts of their home monitoring stations to brave the rigors of mountaintop Dxing, and then blunder into dubious success . . .

As long as I have known Orvy Johnson, even back in junior high school, he could never walk and chew gum at the same time. This had certain negative effects on Orvy's social life. He was anything but athletic, unless pulling up to the dinner table could be considered athletic. Nor was he much with the ladies; several girls I knew had mapped all the routes that Orvy took to school, so they could go the other way. But there was one thing you could say for Orvy Johnson: he had an uncanny and sometimes mystic sense of where and when to find action on a shortwave radio.

He was the only kid in class who owned such a radio: an old Hallicrafters with umpteen tubes, if memory serves me correctly. I think he paid for it by getting current events from foreign news broadcasts and selling them to fellow students in our high school civics class.

Being an SWL myself, I always respected Orvy's radio know-how. Maybe that is why I asked him to accompany me on a recent mountaintop DX-pedition. Of course, the fact that my car was in the garage and that I needed someone to help me carry all the camping and radio gear had nothing to do with it.

Anyway, Orvy and I arrived at the mountain late on a Friday evening after work. Orvy stopped the car and turned off the headlights. We got out and stretched our legs.

"C'mon, let's get this stuff out of the car," I said.

We put all the gear that Orvy was to carry in one stack and mine in another. By pure chance, the portable generator and gasoline can just happened to end up in Orvy's stack. And to that happenstance, he took opposition.

"Your stack is smaller than mine," Orvy said, cocking an overweight eyebrow.

"There are several reasons for that," I answered.

"I'm listening."

"Well, for one thing, you're younger than I am."

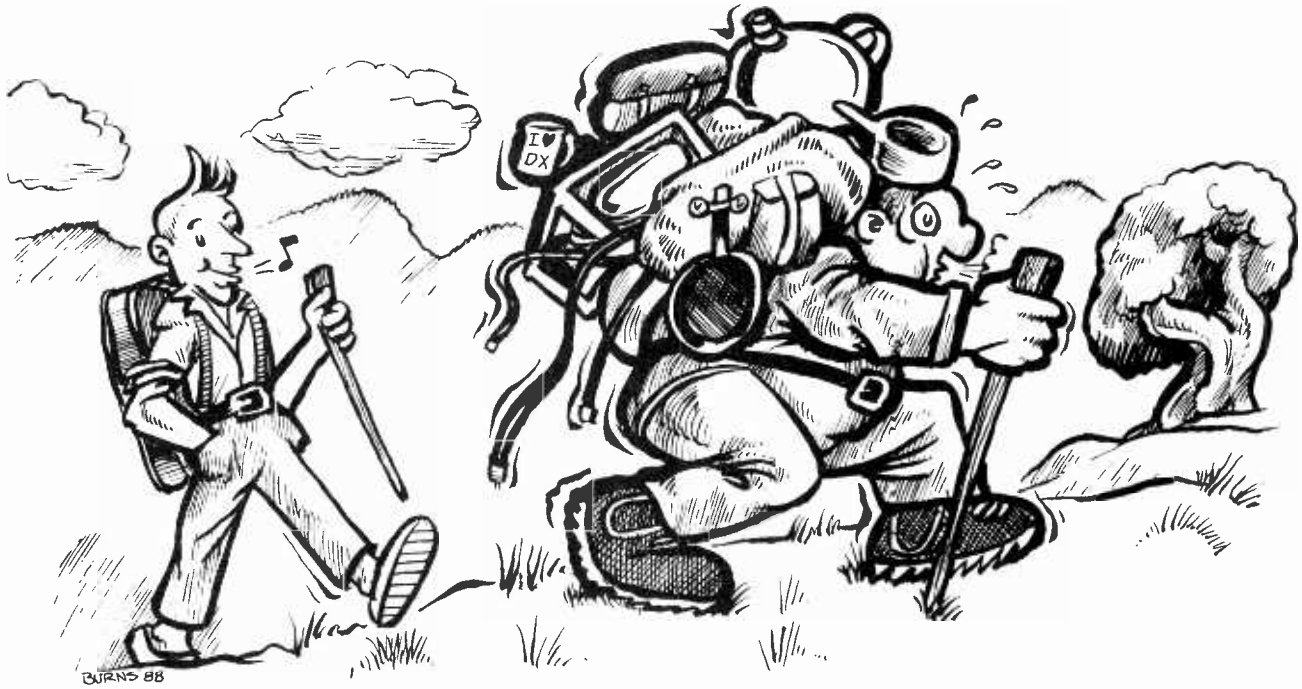
"Only six months."

"You should respect your elders, no matter what the age difference. And another reason is that you are fatter than I am so you need the most exercise."

"I'll respect you more if you carry the generator," Orvy said.

"Tell you what. You carry it the first mile and I'll carry it the second mile."

Orvy liked that logic, and, laden with camping supplies and radio gear, we began the mile-long ascent up Eulan Peak to the campsite where we would spend the weekend DXing with no



power line hash, no man-made static, and no tall buildings to block radio signals.

An hour later, Orvy was beginning to stagger under his cargo.

"I . . . gotta . . . rest," he puffed. "We must . . . puff . . . have gone a mile by now."

"What a coincidence," I said. "There's the campsite right over there in that clearing by the creek."

Orvy dumped the gear in a heap and fell in the middle of it. He was too busy gasping for oxygen to say or do anything else, and that probably was good for me. I put my backpack down and sat just beyond his reach.

"The air sure is clean up here," I said.

"And . . . thin," Orvy gasped.

"Yeah, just look at those brilliant stars. And the moon. It is so bright that it almost hurts your eyes. You won't even need a flashlight to put up the tent."

"Me?!" Orvy snapped.

"Unless you would rather gather firewood," I said.

"I'll gather firewood. You set up the tent," said Orvy.

"Okay, but watch out for snakes."

"Snakes?"

I nodded.

"I'll set up the tent, just to make sure that it gets done right. You get the firewood," Orvy said.

I tried. Really I did. But the serenity of the evening overpowered me. There was no wind. The air was crisp and laden with the scent of pine trees. After walking a short distance, I sat on a smooth, flat stone on a hill overlooking a moonlit valley. The only sounds were those of Orvy wrestling with the tent, pounding stakes into the rocky soil, and broadening his vocabulary of vulgarities.

About fifty feet on either side of where I sat were two fir trees which towered at least one hundred feet into the air. They would be good supports for my G5RV dipole antenna. The rock on which I sat would make a decent monitoring table. Come dawn, Orvy and I would set up the station and start pulling in those flyspeck stations that are so hard to DX in the city.

Sudden silence from the campsite prompted my curiosity. I got up and walked to the campsite and found the tent fully erect. Orvy was inside. I joined him.

"What time is it?" Orvy asked.

"About midnight, I guess."

"Firewood all gathered?"

"Almost."

"Night."

"Brilliant observation."

"Thanks."

"Night."

"ZZZ..."

Dawn came none too soon. The rock that was punching a hole in my spine grew larger by the hour. I suspected that Orvy had planted it there on purpose. I reached over to grab him by the throat and found his sleeping bag empty. I got up, dressed, and stepped out into the morning.

Orvy was hovering over a small campfire. Coffee was perking. Eggs and bacon were crackling in hot grease in the fry pan. It was inspirational.

"I had a little trouble finding the firewood that you supposedly gathered last night," Orvy said.

"Uh huh," I grunted, searching my backpack for a cup.

"Here." Orvy handed me his cup.

"Why are you being so nice?" I asked.

"Well, in a few minutes we have to put up the antenna. I figure that I'll come

out ahead if you're in a good mood. Here, have some eggs."

Dining on crispy eggs and runny bacon, Orvy and I planned our strategy. He would climb the trees and I would toss him the stuff. The G5RV was fed by precisely thirty feet of ladder line and another twenty-five feet of coax. Therefore, Orvy would climb fifty feet and attach pulleys with nylon haul-lines, which we would use to hoist each end of the antenna into position.

Straining out the coffee grounds with our teeth, we finished breakfast, walked to the base of the first tree and stared in awe toward the apex. It looked much higher in daylight than it had looked last night in the obscurity of darkness. There were no limbs to grasp, no handholds, no foot-holds, no way to begin the ascent. I looked at Orvy. He looked at me.

After a grueling hour of clawing, sweating, swearing, and almost falling, we collapsed on a soft layer of pine needles and stared skyward at our handiwork. "She's a beauty, ain't she, Orvy?"

"Yeah. What's the altitude up here?"

"Seven thousand feet," I said.

"Let's see. That puts our antenna at seven thousand and ten feet," Orvy said, brushing my footprints off his shoulders.

"What are we going to do with all of this feed line?" I asked. Orvy did not hear me. He was already in the tent, from which he emerged carrying my beloved and much coveted R-2000. To this day he swears he did not see the tangle of coax that snared his feet.

"Aaaaaaagh!" I said, with admirable restraint, as Orvy plunged headlong and tossed my R-2000 into the air. The next 0.523221 seconds seemed to pass in slow motion. My legs weighed tons. It was like running through chest-deep water. My feet slipped on the pine needles. I did a belly-flop with arms outstretched, not unlike a Dallas Cowboy receiver trying to catch a tie-breaking pass in the end zone in the last five seconds of play. The next thing I remember . . .

"Nice catch," Orvy said.

. . . I was laying on my back and holding the R-2000 tenderly over my head, considering the penalty for justifiable homicide.

"No jury would convict me." I must have mumbled it out loud.

"What say?" Orvy asked.

"Never mind. I'll set up the station. You just sit over there and relax."

By the time my blood pressure had dropped to somewhere between stroke level and mere hypertension, precious signals were crackling from the speaker of the R-2000. I spun the dial quickly through the broadcast bands. Radio Australia was beaming an English news broadcast to North America on 9610. What I heard stopped me cold.

"Hey Orvy! While we slept last night, The U.S. Navy sunk half the Iranian fleet," I said. The next thing I knew, Orvy was on my lap.

He started quoting navy frequencies in the nine meg region, which was particularly hot at the moment. As he called them off, I punched them into the R-2000's memory: 9002, 9006, 9032, 9037, 9257, 9260, 9380. I engaged the memory scan and set the squelch to open at the slightest signal, so that we would not miss anything.

For the next half hour, Orvy and I sat spellbound by frequent breathtaking bursts of . . . cosmic noise.

"This is going nowhere," Orvy said, disengaging the memory scan and dialing toward the lower frequencies.

Several minutes later, he dialed past a male American-sounding voice on upper sideband at about 4037 kilohertz. Rocking the dial back and forth, he quickly tuned-in the station which was fading in QSB.

"Station calling (crackle) say again the nature of your (hiss) emergency (crackle) you are weak and barely readable . . . this is United States warship (crackle) . . . "

The voice faded totally away. For long moments, there was only white noise. Then, ever so faint, we could hear the vessel in distress.

"U.S. warship . . . this is (crackle) tanker (hiss) . . . We request assistance (crackle) speedboats one thousand meters off our port side with (hiss) intentions . . . Do you receive . . . over."

The English was broken and the dialect difficult to understand. The urgency of the tanker's request was plain.

"Roger. We understand. Go to VHF . . ." Putt . . . Pow . . . Putt!

"Gunfire!" Orvy shouted.

"Sounded more like our generator running out of gas," I said.

The R-2000 went silent.

"Yup, it's out of gas all right," Orvy said. "Where is the fuel can?"

"It was in your stack!" I yelled.

"Maybe that's what I heard fall down the mountain on the way up," Orvy said, with an apologetic grin.

Our inevitable trip down the mountain to find the gasoline can went quickly, with Orvy running at top speed and me on his heels swinging a tent pole. By the time we got to the car, we were too tired to hurt each other, so we made up. And counted the gasoline can as missing in action.

As we drove, I turned on the car radio and found a local news broadcast. There were follow-up reports of the navy's firing on Iranian targets in the Persian Gulf. And there was mention of an Iranian gunboat attack on a tanker.

"Think that's what we heard?" Orvy asked pulling into a gas station.

"We don't have enough for confirmation," I said. "But . . . we can be back on the mountain before dark. We have all night and the rest of tomorrow. Maybe we'll get lucky."

With gas and camping supplies replenished (in that order), Orvy and I headed the car back up the mountain, with great expectations. SWLs are that way.

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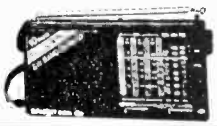

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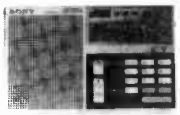

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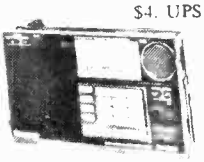

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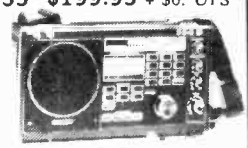

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Albania: After a long dry spell, Radio Tirana has provided a program schedule for 1988. You can take in such gems as *The Marxist-Leninist Movement throughout the World is Growing in Scope and Strenth* on Monday's second broadcast. This is complimented naturally on Tuesday's second broadcast by *The Captitalist World in Disintegration*. Then they lighten up with *The Albanian Woman on the Road of Her Complete Emancipation* on Wednesdays's first.

On Sunday's second, they're back on track with *Marxism-Leninism, An Ever Young and Scientific Doctrine*; Sunday's first broadcast has *Introducing You to Albania*. We can, however, seriously recommend *Folk Music* on Saturday's first. (via William Westenhaver, *Review of International Broadcasting*)

Angola: Pieced together from many logs are these only known active regionals, some very intermittent: Bie on 4894.6 at 0500v-2200 UTC. Benguela 5039v, 6152v, 7260 at 0455-2300. Cabinda, 4969.9, 0545v-2300. Huambo, 5062v, 7160, 0400-2300. Huila, 4820.3, 0400-2300v. Lobito, 7172, 0400-1700. Lunda-Sul, 4859.6, 0500-2230. Moxico, 5191.7, 0500-2300. Namibe, 5405v, 0500-2300. The "v" indicates that the frequency, open or close time of the transmission varies. (Al Quaglieri, *SPEEDX*)

Argentina: Radio Nacional Mendoza, 6178.3, announces it has a repeater on 6130 kHz in Uspallata; not confirmed. (Julian Anderson, Argentina, Onda Corta)

Australia: Radio Australia has started a weekly *Expo Report*, Mondays at 1045, Tuesday 1630, Wednesdays 2120, Thursdays 0745, Fridays 0230 UTC. *Steam-Driven Radio* is a Bicentennial series through October, Saturdays at 0930, Mondays 1930, Tuesdays 1230, Wednesdays 0130, Fridays 0530. (via Bruce MacGibbon, *The DX Spread*)

Austria: Radio Austria International reorganized its English segments so there's a lot more Saturday nights (UTC Sunday) on 9875: 0030 *Report from Austria*; 0100 *Shortwave Panorama*; 0115 *Music for You*; 0130 *Coffeetable* until 0200. 0400 *Coffeetable*; 0430 *Report from Austria*. The 0030 and 0430 broadcasts are heard every night. On UTC Mondays, add *Music for You* at 0400 and *Shortwave Panorama* at 0415.

Canada: CBC is about halfway through a 13-week series, *Pacific Encounters*, documentaries about different aspects of life in Far Eastern countries. The program takes up the final hour of *Sunday Morning*, 1505-1559 UTC on 17820, 11955, 11720 and 9625 kHz. (*WOR*)

Some of the "best DX" is right here in North America, thanks to the low-powered Canadian shortwave broadcast stations. CFVP, Calgary, 100 watts on 6030, is swamped by AFRTS during most hours of darkness but Alan Laves in Dallas tentatively reports them from 0833 until AFRTS came on at 0845. Another trick is to wait for a geomagnetic storm to wipe out interference from overseas stations.

Bob Rankin in Kansas reports hearing 10-watt CKFX, Vancouver, on 6080, May 7th at 0705-0720 UTC. (*Fine Tuning*)

Canary Islands: This is no longer a shortwave broadcasting country. It seems that the two old 50 kilowatt transmitters at Tenerife have worn out. Radio Exterior de Espana used to show 11815 and 15365 in their frequency schedules. Then 11815 vanished and 15365 at 2200-0200 UTC was moved to Noblejas, their main 350-kw transmitter site near Toledo, peninsular Spain. However, a program in Spanish originating in Tenerife is still carried on 15365 at 2200-2300. After 2300, you'll find that there is no satellite delay between 15365 and other REE channels such as 9360, when they carry the same programming. (*WOR*)

China: The CPBS-2 domestic network is now carrying *The American Music Hour*, a commercial program produced by Chinamerica in California, Thursdays at 1000 UTC. They producers of the program promote it as a huge gigaperson advertising opportunity. What seemed like this show was heard between 1043 and 1136 UTC on 5075, 6890, 7770 and 12200. (James Kline, Santa Monica, CA *WOR*)

Colombia: The trend is toward closing down shortwave stations here, not opening them up, but a new one has appeared on 4895, La Voz del Rio Arauca, from sign-on at 1000 UTC. (Ernie Behr, Ont., RCI *SWL Digest*) Also heard at 0047-0150, mentioning mediumwave 1110; it belongs to the Radio Cadena Nacional network. (Don Moore, OH, ibid.)

The 16-meter outlet of Radiodifusora Nacional mentioned last month moved to 17835.7 variable, noted at 0410 with opera on full carrier plus USB, but very faint audio on LSB. (Ernie Behr, Onr. *DX Listening Digest*) In late May, it moved again, to 17808.4 USB variable, on the air from 0930 to 0530 (Behr, and Wolfgang Buschel, W. Germany). See Surinam.

The Exotic Voz de los Centauros becomes even more so by appearing on its fifth harmonic, 29770 kHz, at 1825 (Richard Stoller, NC, RCI *SWL Digest*)

Czechoslovakia: Radio Prague programs include *Brass Band Music*, the last Tuesday of the month; *Christian Comment*, on Saturday during the 0100 and 0300 hours on 5930, 6055, 7345, 9540, 9630, 9740 and 11990. (via William Westenhaver and Kraig Krist, *RIB*). Days are North American not UTC.

Germany, West: Deutsche Welle relay plans: add another transmitter at Sines, Portugal; two more of 300 kw at Kigali, Rwanda; extend satellite feeds to Sines, Kigali, Malta early next year; reactivate Trincomalee, Sri Lanka very soon (Peter Senger, DW, via William O. Dickerman, PA)

DW SSB feeders, all monitored recently at various times of the day: 5195, 6887, 6955, 6975, 7490, 7767.5, 9140, 10922 kHz (Peter Schoeltzel, Lohhof, W. Germany)

Stadtbummel, the German program which "gives away a city," that is, a free trip to somewhere in West Germany, has been rescheduled to every 8-weeks rather than every 5-weeks. That should make the next one July 17, at 0630, repeated every four hours. (William Westenhaver)

Greece: Home Service relays to Greek workers all over Europe have been carried on two 35-kilowatt transmitters at Thessaloniki on 9935 and 11595 but now a third much stronger unit has been added, likely the VOA facility at Kavala, 9425 between 1400 and 2200 (Wolfgang Buschel, Stuttgart, W. Germany, *WOR*)

Hungary: The DX program from Budapest is at 0130, not 0230. Another show in English never appears in printed English schedules. You must get the Hungarian version to find out about it: Hungarian history , rescheduled to Tuesdays and Fridays at 2130-2200; repeated UTC Wednesdays and Saturdays 0100-0130 on 15160, 11910, 9835, 9585, 9520, 6110.

On June 28 and July 1, it's about Gabor Bathori, the whimsical prince and Gabor Bethlen, the renaissance ruler of Transylvania (*WOR*). The English schedule carries this ad: "Delicious Herz and Pick salami come from Hungary! Tune into Hungary -- the land of tasty Herz salami. Herz salamis are long, our programmes are short, but we hope just as enjoyable! (via Kraig Krist, *WOR*)

WORLD RADIO NEWS

Iceland: Rikisutvarpid has been monitored on USB: 11745 and 13723 at 1215-1245; 13770, 15662, 17560 at 1855-1935 (Wolfgang Buschel, Stuttgart, RCI *SWL Digest*)

Indonesia: When Radio Republik Indonesia Ambon reactivated in early May, it was on new 4863.9, first reported by Kirk Allen in Oklahoma at 1010 until early closing at 1131. But by May's end, it had shifted to 4845.2 kHz. If you can get it to fade in before 0900, English has been reported then by Peter Bunn in *OzDX*, Australia. (RCI *SWLD*)

Israel: Israel has veried some frequencies to avoid interference at 1900, using 12080 instead of 12077 and 15592 instead of 15585. At 2130 also on 12080, a rare case of a split being nominal, even being actual! (via Wolfgang Buschel, W. Germany). The next Jewish holiday provoking special programming is Tisha B'Av (Fast of the Ninth Av) on July 23/24. (*RIB*)

Korea, North: Radio Pyongyang has moved up to 16 meters for the first time in memory, for English at 0700-0800, confirmed on 17795 (Ed LaCrosse, CA, and Bob Padula, Australia, *WOR* and RCI *SWLD*)

Liberia: ELWA secular programming is deficient, but a National Newscast is scheduled just before closing down 11830 kHz, for 5 minutes at 2200 (Saturday 2145), beamed 81 degrees with 50 kilowatts. (via Rowland Archer, NC *WOR*)

Marshall Islands: WSZO has dropped 4940 kHz, believed due to antenna and local TV-interference problems; 6070 has terrible interference until 1000 sign-off (Chuck Boehnke, Hawaii). Probably RRI Jayapura, back on 6070 (Geoff Cosier, *OzDX*). WSZO plans to move back to 4940 (Henry Lazarus, LA *FT*). They welcome reception reports but receive hundreds per month and are behind in replying. Be patient and include return postage. (Richard Eckman, *DX Ontario*)

Netherlands Antilles: TWR bonaire's 250-kilowatt transmitter must be the most under-utilized one in the world, schedule only a bit more than three hours per day. But now they've added 15345 to 50 kw on 11815 for English at 1110, though powered down to only 80 kw, and beamed toward Charlotte and Fort Wayne, while 11815 is centered on Cape Canaveral and St. Louis. (*WOR*)

Norway: A hole in the blanket developed on the first of last month as NRK replaced 15295 with 15190 at 1400. Among summer program topics are Norwegian words in English, and blimping in the North (via Kraig Krist).

Peru: A new one here is Radio Atahualpa, 4821.6, Cajamarca, heard around 1000 by Chuck Bolland, FL; Dave Valko, PA; Kirk Allen, OK; Ernie Behr, Ont; Rowland Archer, NC, *DXLD*).

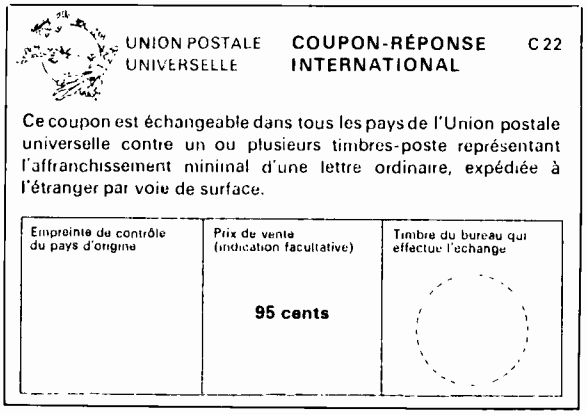
Seychelles: The new BBC relay plans to open on September 25, but tests could start right away. (Radio Netherlands *Media Network*)

Sierra Leone: The reactivated 5980 has been heard until 2300 and again until 0700, by short and long-paths, respectively, nothing in English, and seems irregular (Bob Padula, Australia, *DXLD*). The transmitter was supposedly rented out to propagate Islam. Was once 250 kw, but sounds like even less than the listed 10 kw -- unless using wet linguini as antenna. (Al Quaglieri, NY, *DXLD)*

Surinam: Radio Surinam International, via Brazil, weekdays at 1700-1752, moved again, from 17835 to 17875 (Wolfgang Buschel, W. Germany). See Colombia.

Sweden: See our May column; the SSB relays are going to continue at least through 1988.

Switzerland: Red Cross Broadcasting Service programs are schedule UTC Tuesdays and Fridays, June 28, July 1, August 2, 5, 30, September 2 at 0310-0327 on 6135, 9725, 9885 and 12035 kHz. (Kevin Klein, James Klein, Jim Renfrew, *DXLD*)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IRC's now cost 95 cents each in the US. An airmail reply to your reception may require as many as six! Glenn Hauser looks at the IRC in next month's Monitoring Times.

Turkey: TRT domestic service has shown up on the very strange frequency of 14880, though scheduled on 15220, between 0400 and 1600. (Al Quaglieri, Bruce MacGibbon, William Westenhaver, Bob Padula, *DXLD*)

USSR: Radio Moscow World Service has a new program entitled -- what else -- *Perestroika*, Sundays at 0211, 0511, 0911, 1311, 1611, 1911 and 2311 UTC. (via Kraig Krist, *DXLD*)

United Arab Emirates: Dubai is audible at 0500 UTC on 21700 (Bob Hill, MA, *DXLD*). Thanks to the midnight sun; this is the time of yuear to DX 17 and 21 MHz all night.

UKOGBANI: BBC World Service is bringing back its Caribbean service with a Monday through Friday Caribbean Report at 2115-2130 via Antigua on 5975 only, from July 4th. During the Olympics, the BBC plans to experiment with splitting the World Service into two -- one for news, the other for entertainment.

USA: WWCR, Nashville, has set back its target date to November 1, due to antenna delays, but tests could start in September on 15690 and 7520 (Bruce MacGibbon, RCI *DXLD*)

New Covenant Educational Ministries has a construction permit for a new 100-kw shortwave station to be located 30 miles west of Jacksonville, Florida, on Road 229, 5.3 miles south of Sanderson, at 30-11-03 north, 82-15-45 west. (FCC)

NDXE, which after many years of trying, has not been able to build its own transmitter in Alabama, has approached the Voice of America to rent its mothballed site at Dixon, California. But VOA says there are no plans to activate it. (*Media Network*)

Two well known Scandinavian listeners, Rolf Lovstrom and Lars Ryden, complain that NDXE has charged their credit cards for expensive material they never ordered or received. If NDXE has your credit card number, beware.

VOA is dropping another language on the first of this month: Thai at 2330 to 2400 on 11775, 15215 and 17810 kHz via the Philippines, and 18137.5 SSB feeder from California. This is causing hardships for some of the Thai language staff who are forced to leave the country immediately.

☆ ☆ ☆

You can hear Glenn Hauser's DX news every week over RCI's SWL Digest: Sat 2021 on 17875, 17820, 15325, 11945, 9555, 6030; 2151 on 17820, 15150, 11880; UTC Sun 0021 on 9755, 5960; Sun 2321 on 11730, 9755; Tues 1247 on 9625, 11855, 17820. A broader range of information appears on World of Radio, via WRNO, New Orleans; Thurs 1500 on 11965, UTC Fri 0030 on 7355, Sat 0300 on 6185, 2330, on 13760, Sun 2030 on 15420; and via Radio for Peace International, Costa Rica, Tues 2300 on 13660, Wed 0300 on 7375; Fri 2100 and Sat 0100 on the same.

Review of International Broadcasting, also with Satellite Watch and Radio Equipment Forum columns, can be sampled for $2; 10 issues for $21. Same rates apply to DX Listening Digest, plus Enjoying Radio section; or both for $40, from Glenn Hauser. (Rates apply to USA, Canada, Mexico; US funds only on a US bank or postal money order.) For further information send a self-addressed stamped envelope to the address in the masthead.

Broadcast Loggings

English broadcast unless otherwise indicated

0002 UTC on 11905
Brazil: Radio Universo. Portuguese. Brazilian music ballads and "Radio Universo" ID at 0030 UTC. Interference from KCBI on 11910 kHz. (Fred Carlisle, Tumwater, WA)

0010 UTC on 9630
Spain: Spanish Foreign Radio. World newscast with Spanish music and feature on NATO. Heard on parallel frequency 6125 kHz. (George Neff, Tampa, FL)

0020 UTC on 15190
Brazil: Radio Inconfidencia. Portuguese. Phone chat with listener, talking about Brazil. Station news reports on politics.

0030 UTC on 11965
Brazil: Radio Record. Portuguese. Brazilian soccer game commentary with breaks for IDs. Interference from HCJB. (Fred Carlisle, Tumwater, WA)

0034 UTC on 5910
Belgium: BRT. Recipe for leeks! Report on international guitar festival. (George Neff, Tampa, FL)

0100 UTC on 9575
Italy: RAI. Report of new Italian Fiat coming out. (Bob Fraser, Cohasset, MA)

0100 UTC on 9435
Israel: KOL. Newspaper editorial program The Week in Review and 0200 feature, Israel News Program. (Al Rayment, Nelson, BC Canada)

0100 UTC on 4770
Venezuela: Radio Mundial Bolivar. Spanish. Station identification and terrific Latin salsa music! (Harold Frodge, Midland, MI)

0101 UTC on 9910
India: AIR-Aligarh. International news and editorial on heroin smuggling from Pakistan. (Fred Carlisle, Tumwater, WA)

0103 UTC on 4780
Venezuela: La Voz de Carabobo. Spanish. Local commercials for the city of Valencia and a public service announcement for Safety Week. Intermittent signal fading. (Harold Frodge, Midland, MI)

0114 UTC on 6085
West Germany: Deutsche Welle. Letter from Bonn feature and light classical music program. (Bruce Gilson, Silver Springs, MD)

0116 UTC on 7375
Costa Rica: Radio for Peace. Discussion on the National Audubon Society's study on world population. ID at 0130 UTC as, "from the University of Peace in Costa Rica." (Mike Loran, Azusa, CA)

0122 UTC on 4920
Ecuador: Radio Quito. Spanish. Latin pop vocals and commercial for "Tropico Seco," with "Radio Quito la voz de la Capital" ID. (Harold Frodge, Midland, MI)

0125 UTC on 7345
Czechoslovakia: Radio Prague. Report on yachting on the Czech lakes. Heard parallel on 5930, 9540, and 11990 kHz. (Bob Fraser, Cohasset, MA)

0129 UTC on 17795
Australia: Radio Australia. Station ID with UTC time check and discussion on chemotherapy for children. (George Neff, Tampa, FL)

0138 UTC on 6214
Clandestine: Radio Quince de Septiembre. Spanish. Commentary on Nicaragua and neighboring countries. Latin vocals and station slogan as, "Radio Liberlad de Nicaragua." Anthem and sign-off at 0200 UTC. (Harold Frodge, Midland, MI) (This anti-Sandinistas station has been heard nightly. -- ed.

0220 UTC on 7250
Iraq: Radio Baghdad. Arabic. Middle Eastern music, talk, and Koran at 0246 UTC. Partial ID noted as "Iraqiyya fi Baghdad." Also monitored in Arabic on 7280 kHz at 1504 UTC. Newscast with good signal, and on parallel frequency 6010 kHz. (Bruce MacGibbon, Gresham, OR)

0235 UTC on 11825
Tahiti: R.F.O.-Society Islands. French/Tahitian. Pop music program with several station IDs. (Stanley Trevor, Flagstaff, AZ)

0236 UTC on 7065
Albania: Radio Tirana. Text on United States worldwide military presence. (Alan Reese, Mather AFB, CA)

0250 UTC on 4954.9
Brazil: Radio Marajoara. Portuguese. Brazilian music at tune-in with station ID at 0251 and 0259 UTC. Sign-off at 0301. Signal most audible in lower sideband mode to avoid morse code interference. (Cliff Goodlet, Chattanooga, TN) (Station also audible during 0815-0900 UTC --ed.)

0314 UTC on 6305
Clandestine: La Voz del Cid. Spanish. Sports commentary for "beisbol" game and discussion on Latin America's medical profession. (Harold Frodge, Midland, MI)

0330 UTC on 9525
USA: Radio Marti. Spanish. Rock music program of Eric Clapton music. VOA news in English at 0400 UTC. Poor signal. (James Kline, Santa Monica, CA)

0335 UTC on 15150
New Zealand: Radio New Zealand. Station ID at 0340 into 1960s era music program. Signal fair. (Trevor Stanley, Flagstaff, AZ)

0340 UTC on 4885
Brazil: Radio Clube do Para. Portuguese. La Bamba Spanish tune and "Radio Clube" station IDs. (Harold Frodge, Midland, MI)

0415 UTC on 9445
Turkey: Voice of Turkey. Station ID with news and Turkish history lesson on the Balkan uproar in 1878. (Al Rayment, Nelson, BC, Canada)

0430 UTC on 6015
Austria: Radio Austria International. Station ID with Viennese Waltz interval signal. Program review with news and sports report. Feature on tourism in Austria. (Trevor Stanley, Flagstaff, AZ)

0500 UTC on 9665
South Africa: Radio Five. U.S. and British pop tunes with local ads. (Pete Wahlquist, Reseda, CA)

0520 UTC on 7255
Nigeria: Voice of Nigeria. Talk show on the Japanese helping to fight disease in Nigeria. (Alan Reese, Mather AFB, CA)

0533 UTC on 11760
Cook Islands: Radio Cook Islands. Michael Jackson's "I'm Bad" hit into 60's "Louie Louie." Quite weak with fade out by 0550 UTC. Log submitted as tentative. (Donna Robinson, Willow Springs, IL)

0612 UTC on 6165
Netherlands Antilles: Images program hindered by interference. Parallel frequency 9715 heard. (Lance Micklus, Essex Junction, VT) What station? -- ed.

0708 UTC on 4760
Liberia: ELWA. News, station ID, and religious programming. (James Kline, Santa Monica, CA)

0720 UTC on 5020
Solomon Islands: Solomon Islands Broadcasting Corp. Local island and pop music with national news and a two-minute noodle commercial! Heard on parallel frequency 9545 kHz. (James Kline, Santa Monica, CA)

0722 UTC on 3300
Guatemala: Radio Cultural. Instrumental music and religious format. Poor fidelity. (Lance Micklus, Essex Junciton, VT)

0814 UTC on 3374.4
Brazil: Radio Nacional Sao Gabriel. Portuguese. Local morning show announcements with time check and Nacional ID. (Larry Miller, Thorndale, PA)

0958 UTC on 4819.6
Ecuador: Radio Paz y Bien. Spanish. ID at 0959 UTC with religious program announced as, "Radio Vaticana Latina LAmericana." (Cliff Goodlet, Chkattanooga, TN)

1034 UTC on 9735
Paraguay: Radio Nacional. Spanish. News commentary at 1035 UTC with station IDs. Signal covered by Deutsch Welle at 1050 UTC. (Cliff Goodlet, Chattanooga, TN)

1041 UTC on 6120.5
Nicaragua: Radio Zinica. Spanish. ID as "Radio Zinica" with mentions of Bluefields. Latin music covered by Radio Japan at 1055 on 6120 kHz. (Cliff Goodlet, Chattanooga, TN)

1048 UTC on 5025
Peru: Radio Quillabamba. Spanish. Sign-on at 1048 with anthem and ID. Religious programming and Latin vocals. (Errol Urbelis, King's Park, NY)

1049 UTC on 6115.7
Columbia: La Voz del Llano. Spanish. National newscast, commercials, and

WORLD RADIO NEWS

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160 Lester Drive, Orange Park, FL 32073

ID at 1100 UTC. (Cliff Goodlet, Chattanooga, TN)

1100 UTC on 3380
Guatemala: Radio Chortis. Spanish. Sign-on at 1100 UTC into marimba music, IDs and time checks. (Errol Urbelis, King's Park, NY)

1130 UTC on 3325
Papua New Guinea-Bouganville: Radio North Solomons. Caught "Radio North Solomons" at tune-in. Island music on wooden flutes with announcer breaks. No interference from Radio Maya de Barillas, Guatemala, this morning! --ed.

1145 UTC on 3395
Papua New Guinea: Radio Eastern Highlands. Pidgin. Program notes, local time checks and ID. Island music amid excessive interferece.-ed.

1200 UTC on 4890
Papua New Guinea: NBC-Port Moresby. Music variety program and local announcements. Extensive signal interference. (Stanley Mayo, Westbrook, ME)

1214 UTC on 11937.8
Kampuchea: Voice of Kampuchean People. French. Newscast with Phnom Penh ID at 1226 with station time and frequency schedule. (Stanley Mayo, Westbrook, ME)

1234 UTC on 3910
Japan: FEN/AFRTS. Sport scores and report on political primaries. Heard also on parallel frequency 6155 kHz. (James Kline, Santa Monica, CA)

1247 UTC on 15060
Saudi Arabia: BSKSA. Arabic. Koran recitations. Signal time tone and ID at 1300 UTC. (Cliff Goodlet, Chattanooga, TN)

1313 UTC on 15140
Chile: Radio Nacional de Chile. Spanish. News in progress with ID at 1316 UTC. Abrupt sign-off at 1319 UTC. (Cliff Goodlet, Chattanooga, TN)

1405 UTC on 9720
Sri Lanka: Sri Lanka Broadcasting Corp. Lady DJ playing U.S. pop music program. "SLBC" ID at 1500 followed by news on India and Sri Lanka. (Fred Carlisle, Tumwater, WA)

1412 UTC on 15400
Finland: Radio Finland. Discussion about Finland's environment and press review. (James Kline, Santa Monica, CA)

1445 UTC on 5985
Burma: Burma Broadcasting Service. News of Nicaragua and Honduras relations. ID as "This news came to you from the Burma Broadcasting Service." Interference from Radio Japan and Radio Moscow. (Fred Carlisle, Tumwater, WA)

1453 UTC on 15305
Mongolia: Radio Ulan Bator. News from lady announcer, audible only in lower sideband mode. Interference from Radio Norway and Radio France Int'l. No parallel frequency 9575 heard. Log submitted as tentative. (Fred Carlisle, Tumwater, WA)

1455 UTC on 4950
Malaysia: RTM-Sarawak. Business news and Malaysian rubber/tin prices. Nat King Cole music at 1522 UTC. (Mike Loran, Azusa, CA)

1500 UTC on 11980
Guam: Adventist World Radio. Program The Music Scrapbook. Station ID with news on special anniversary QSL information. (James Kline, Santa Monica, CA)

1517 UTC on 17755
South Africa: Radio RSA. Country and western music. DXer's letters and station frequency schedule at 1525 UTC. (Bruce Gilson, Silver Springs, MD)

1520 UTC on 11940
Singapore: Singapore Broadcasting Corp-Radio One. Weather forecast and easy listening music. "Oldies" tunes with IDs and news-in-brief spots. Sign-off at 1604 UTC. (James Kline, Santa Monica, CA)

1545 UTC on 11810
Vatican City: Vatican Radio. African service discusses church leaders arrested in South African demonstrations. (Terry Coker, Cucamonga, CA)

1550 UTC on 11790
Indonesia: Voice of Indonesia. Station ID at 1557 followed by broadcast schedule and "island music." Heard on parallel 15150 kHz. (Mike Loran, Azusa, CA)

1815 UTC on 9720
Cuba: Radio Havana. Spanish. Feature on Fidel Castro at opening of Havana hospital. (Juan Franco Crespo, Barcelona, Spain)

1835 UTC on 15600
Liberia: V.O.A. Warren Sheer with Science Report. Signal splatter from co-channel. (Lance Micklus, Essex Junction, VT)

1945 UTC on 11665
Kuwait: Radio Kuwait. Rock music from Madonna and study of text on the Koran. DJ continues rocking with rap music.

2100 UTC on 17835
Japan: Radio Japan. World and national news with program "Japan Scene." Station ID and Nippon Digest. (Trevor Stanley, Flagstaff, AZ)

2100 UTC on 9910
India: AIR-Delhi. AIR identification at 2130 and Indian music. Excellent signal! (R. Ferretti. Donora, PA)

2130 UTC on 7195
USSR: Radio Moscow. Folk Box program on Russian folk music. Heard on parallel frequency 5945, 7150, 7310, and 11840. (Bob Fraser, Cohasset, MA)

2229 UTC on 4830
Gabon: Afrique # 1. Oldies music from the McGuire ISisters and 60's funkadelic! What a mix! (Cliff Goodlet, Chattanooga, TN)

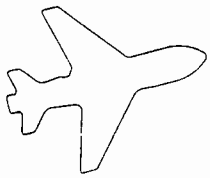
2300 UTC on 4990
Nigeria: Radio Nigeria-Lagos. Just Jazz music program and station ID. (Cliff Goodlet, Chattanooga, TN)

2330 UTC on 4890
Senegal: ORTF. French. African/Arabic music styles with chat about Dakar. Pop and easy-listening tunes with ID, and news headlines. Abrupt sign-off at 0001 UTC, minus national anthem. (Rod Pearson, St. Augustine, FL)

2330 UTC on 15575
South Korea: Radio Korea. Electronic bells interval signal with frequency schedule. News on preparations for the Summer Olympics. (Martin Peck, Bronx, NY)

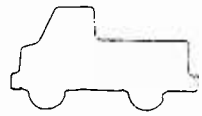
2348 UTC on 4770
Venezuela: Radio Mundial Bolivar. Spanish. Latin music with announcer voice over for station ID. (Cliff Goodlet, Chattanooga, TN)

Bill Battles' (E.Kingston, MA) well-equipped monitoring post: ICOM R-70 and R-71A, Realistic DX-400 receivers; Realistic PRO-2004, Regency MX3000, Regency ACT-R-106 scanners; Unimetrics SSB CB; ICOM M-80 VHF scanning marine txvr; Sonar VHF-Txvr. Nice set-up, Bill!



Utility World

Larry Van Horn
160 Lester Drive
Orange Park, FL 32073



SAC Communications: Last month's Utility World column presented the most comprehensive frequency list of Strategic Air Command frequencies ever in print. By now most of you have probably tried out a few of the listed frequencies and are asking what is going on out there. This month I would like to take a brief look at SAC callsigns and messages. Some of the information that is presented this month has come from semi-official sources that have a working knowledge of SAC's communication system.

One of the first things that a new SAC monitor notices when tuning in primary air-to-ground channels is that some stations transmit tones after they conclude a transmission. These tones serve an important purpose. They are used to key-up remote sites via satellite and terrestrial circuits. These remote sites are used to ensure reliable communication paths to SAC units scattered around the world.

The operator at one of the SAC control points (McClellan, Offutt, or Andrews) uses a telephone keyboard to select the remote site(s) he desires to transmit through. For instance, by punching in the number "38," the remote site at Loring AFB could be selected. At the end of the transmission an "83" would be used to disconnect the link.

Occasionally, both sets of tones are heard and this is indicative of the operator using two transmitters, one at the remote site and one at his site. You can also observe the famous SAC echo effect when this happens.

Deciphering SAC Messages: A variety of messages are transmitted by the Strategic Air Command. These messages are encrypted to prevent disclosure of sensitive information. However, a monitor can keep tabs on the general state of SAC goings and comings by listening carefully to these cryptic messages.

The most common of all messages is the EAM (emergency action message). During special periods of time set aside each hour (called Alpha monitor), all stations standby on primary SAC frequencies to monitor the latest EAM broadcast.

There are two types of EAM messages that are normally sent during Alpha monitor periods. The most common heard is the Five Character repeat broadcast. These messages will sound something like this:

QT450 standby, QT450 standby, message follows QT4505PLJ-3DH3ON3C2AVENHEH I say again QT4505PLJ3DH3ON3C-2AVENHEH, this is Sandwich, out.

Up front one notices that the first five characters of the message are repeated twice before the actual message starts. This is used as an aid to airborne units. Instead of copying the message when it first starts out, the aircrew can listen to the first five characters. If they are already in receipt of that message, they can ignore the broadcast and go about their duties aboard the aircraft. If not, it gives them time to gather the things they need to copy the message.

These five character repeat messages are commonly used to pass operational traffic and go-codes to SAC units and vary in length. Recently I monitored one broadcast that had 64 characters in the message.

By examining the example of the five character repeat EAM message, you have probably noticed that it does not appear to make any sense. SAC wants it that way. To the casual listener or to the enemy, any SAC message that you hear will not be broadcast in clear text. All messages are encrypted prior to broadcast so as not to divulge the contents of the message being transmitted.

The second, more interesting type of message is the 3/2 DNA repeat messages. These broadcasts will sound something like this:

Skyking, skyking do not answer Oscar Charlie Golf, time 53 authentication Sierra Juliett, I say again, skyking, skyking do not answer Oscar Charlie Golf, time 53 authentication Sierra Juliett, Sandwich out.

These little messages are used for a go or cancel orders to SAC aircraft. One of the more interesting things to listen to is when that little message is repeated three times. If you should hear it repeated three times and you aren't already on Alpha one (daytime) or Quebec (nighttime), tune in one of those channels. I will let you draw your own conclusion.

Another type of message one comes across from time to time are aircraft operational messages. These are usually from aircraft on training missions. Once communications has been established to a ground unit the following type message will be broadcast (comments in parenthesis are mine):

Sandwich this is HIFI 33...

Item 1 - *032330Z*	(day/time of report)
Item 2 - *HIFI 33*	(aircraft callsign)
Item 3 - *IR405*	(training route the aircraft is flying)
Item 4/5/6 -	(series of numbers that indicate the entry/middle/exit points of the route)
Item 7 -	(most of the time none but can be used for severe weather report such as a pirep used by civilian pilots).
Item 8 -	(might not be reported at all, it is an optional outside air temperature report)

There are other possible versions of this message but this seems to be the one most commonly used at the present time.

Callsigns: Callsigns used by SAC are just as varied as the messages that the Strategic Air Command sends. There are notable exceptions, however. The first is the callsign Skyking. It is the SAC equivalent of CQ or Calling all SAC Aircraft. The second is Skybird. This is used by aircraft to call any SAC ground station.

Most SAC callsigns change frequently and thus are considered tactical in nature. However, some SAC callsigns do not change and remain constant. These callsigns are used by Air National Guard units supporting SAC missions. For instance, the callsign HIFI is used by KC-135 tankers based out of Pease AFB, New Hampshire. HIFI aircraft are attached to the 157th aerial refueling group (New Hampshire Air National Guard).

One bit of detective work you can use to identify where an aircraft is based is to listen when it makes a phone patch and copy down the telephone prefix the call is going to. For example, If HIFI 33 is calling HIFI control, and the telephone prefix is 8512, the aircraft has just called his home base of operations at Pease AFB.

The government utilizes its own telephone system called Autovon. Just as area codes and telephone exchanges indicate a certain calling area on civilian phone systems, Autovon prefixes indicate the military installation being called.

Table One: Autovon Prefixes

SAC Base	Prefix	Aircraft
Offutt	271	E4B-EC135
Vandenberg	276	XXXXXXXX
Minot	344	B52-EC135
Castle	347	B52-KC135
Fairchild	352	B52-KC135-KC10
Grandforks	362	B52-KC135
Beale	368	SR71-U2-TR1-KC135
Dyess	461	B1-B52-KC135-KC10
Klsawyer	472	B52-KC135
Fewarren	481	EC135
Griffiss	587	B52-KC135
Wurtsmith	623	B52-KC135
Malmstrom	632	EC135
McClellan	633	School EF111-FB111
Blytheville	637	B52-KC135-EC135
Plattsburg	689	FB111-KC135
Carswell	739	B52-KC135
McConnell	743	KC10-KC135-B1
Ellsworth	747	EC135-B52-KC135-B1
Barksdale	781	B52-KC135-KC10
Mather	828	B52-KC135
Pease	852	FB111-KC135
Loring	920	B52-KC135
Grissom	928	B52-KC135-EC135-E4
March	947	KC135-KC10
Whiteman	975	EC135

Table one is a list of current Autovon prefixes or major SAC bases that can be used to help identify possible bases of operation for SAC units.

Some generalities can be discussed even about tactical callsigns in use. Callsigns that use four letters followed by two numbers are usually associated with bomber aircraft. Eight letter callsigns followed by two numbers are representative of EC-135 aircraft. Eight letter callsigns are utilized by SAC control points such as McClellan, Andrews, and Offutt Air Force Bases. Two word callsigns totalling eight letters have sometimes been associated with airborne command posts. One source indicates that seven letters followed by numbers are used by U2 and SR71 recon aircraft.

Updates to the SAC information presented over the last two months are appreciated. You can send them to *Utility World* care of the address listed in the masthead.

Federal Highway Administration Networks

As mentioned in the February issue of *Monitoring Times,* monitors have uncovered a HF network operated by the Federal Highway Administration. The FHWA net links regional and field offices nationwide. It's intended to coordinate emergency mass evacuation on the highways. Stations in the network use Sunair 100 watt/1000 watt transceivers and Dovetron RTTY terminals for SSB and 110/300 baud (850 Hz shift) ASCII transmissions.

In addition to 9197 and 10891 kHz mentioned in the February article, two new frequencies have been uncovered: 5255 and 9172 kHz. Frequency assignments are coordinated by the U.S. Coast Guard.

Network practice drills are held in March, June, September and December at 1500 UTC on Thursday with participation from other DOT agencies including the FAA (Federal Aviation Administration) and the Office of Emergency Transportation (OET).

Some of the callsigns monitored include: WWJ40, WWJ45 (Chicago, Illinois), WWJ65 (Raleigh, North Carolina), WWJ82 (Lincoln, Nebraska), WWH7, WWC9, WWJ6, WWJ7, WWJ86, WWJ89 and WWJ90.

It is believed that this network might have dozens of additional frequencies. Information on this new network is understandably sketchy; we would appreciate additional details on frequencies, callsigns and locations from our readers.

Unknown Network

Recently heard on 6803.0 kHz in USB at 1455 were WNIM867 (St. Louis, MO), WNHI785 (Little Rock, AR) and WNFT417 (NJ). These three stations discussed propagation conditions and agreed to meet a few days later on Channel 50. Nothing further heard.

One observation I can make about this frequency is that in the U.S. it is assigned to the U.S. Department of Energy. Hope that helps in researching this mystery.

Utility World Mailbag

Alan Hesse out in California wrote and asked why some stations like CKN repeatedly call another station (I.E. NAWS and C13E). Alan, these aren't really callsigns but circuit designators used by primarily Canadian Forces stations. NAWS is used to ID the channel that transmits the Naval/Aviation Weather Service. C13E/C13L are special circuit designators used by Canadian Forces stations.

Lance Micklus recently received an experimental transmission from AT&T station WOO, Ocean Gate Radio, at his Essex Junction, Vermont, listening post while monitoring 8051.5.

This broadcast provides up to the minute traffic list and weather information to mobile stations as a public service. To document its usefulness, AT&T requests data that shows how you feel about the service. Send a QSL card, postcard or letter (preferably once a month to provide recent and continuing data) to: Mr. John Morgan, AT&T, Post Office Box 550, Manahaukin, NJ 08050 USA. Thanks for your interest and support.

It's not often a utility station openly solicits reception reports so those of you who have RTTY capability and can receive SITOR transmissions might want to get a verification while this friendly policy exists. Thanks for the information, Lance.

In addition to some excellent loggings of Soviet ships, veteran Sam Ricks provides the following insight on monitoring the Soviet spaceflight tracking network.

The Soviet spaceflight tracking vessels apparently stay at sea for four to six months before being relieved. Tracking ships in the North Atlantic frequent the area around Sable Island off Nova Scotia. Ships operating in the North Atlantic change crews at Rotterdam, while those in the South Atlantic use Montevideo.

Sam says he started concentrating on the spaceflight tracking ships after seeing a Tass report on the Soviet space shuttle project. An unmanned launch of the Soviet shuttle was planned for last month.

Andy Gordon in West Hartfield, CT, enjoys monitoring navy ships. Andy says a good frequency to watch is navy harbor common on 2716.0. Some of the shore stations working navy ships on this frequency include: San Diego Control (CA), Long Beach Control (CA), Mayport (FL), Newport (RI), Norfolk (VA), Little Creek (VA), New Orleans (LA), Charleston (SC), Panama, and Roosevelt Roads (PR).

Navy ship monitors might want to camp out on this frequency as navy ships normally ID with the ship name via the three character alphanumeric tactical callsigns heavily used on navy frequencies.

Free Aeromaps

Aero monitors that would like to have a 14 inch by 10 inch world map showing ICAO locations and HF aero networks can write to the following address: ARINC, 2551 Riva Road, Annapolis, MD 21401

The only stipulation is that you include a statement with your request that you are aware of and intend to comply with the Communication Privacy Act. A small price to pay to receive a free shack reference. Remember, be sure to mention *Monitoring Times* when you write.

Now on with this month's loggings from the Utility World.

Utility Loggings

Abbreviations Used in this Column

All times UTC, frequencies in kilohertz
All voice transmissions are English unless otherwise noted

AM	Amplitude Modulation
ARQ	Sitor
CW	Morse Code
FAX	Facsimile
FEC	Forward Error Correction
ID	Identification
ISB	Independent Sideband
LSB	Lower Sideband
RTTY	Radioteletype
UNID	Unidentified
USB	Upper Sideband

2025.0 UNID FAX signal noted at 1154. Signal too weak and too much noise on frequency to get a readable copy from the PK-232

2454.4 Possible oil drilling or USCG channel. Noted activity at 1200 in USB talking about going back to deep water and hauling something. (Rod Pearson, St. Augustine, FL) Welcome back, Rod.

2670.0 NMF-U.S. Coast Guard, Boston, MA, with a female operator giving coastal weather information at 1040 in USB. (Lance Micklus, Essex Junction, VT) Welcome to Utility World, Lance, Please report often-ed.

2700.2 6W?-Dakar, Senegal, T425A (DKA) meteo and T425B (SMA) meteo to Nouakchott at 0130. Both channels active 0000-0300 with no interference from 5BA-Nicosia, Cyprus, phone this evening. (Fred Hetherington, Ormond Beach, FL) A hearty welcome to my fellow Sunshine State contributor and RTTY monitor extraordinaire. Great work in Bob's latest book, Fred. Please return often.

2716.0 USS Clark, FFG-11 calling Newport Harbor control at 0900 in USB. (Andy Gordan, West Hartford, CT) Welcome back, Andy. For our reader's benefit, Andy's log is on a common navy harbor channel nationwide-ed.

3130.1 Navy stations Q7F, H6F, 6CT, S5S, U1J heard. H6F and GCT were looking for a "playground" to use. Transmissions heard at 0236 in USB. (Russ Oder, Orange Park, FL) Welcome to the column, Russ, please return often.

3225.5 Female Spanish number stationm monitored at 0522, stopped transmission at 0525. (Lance Micklus, Essex Junction, VT)

3430.0 Two UNID stations in Spanish transmitting between authorized aeronautical mobile frequencies at 0313 in USB. (Russ Oder, Orange Park, FL)

3810.0 HD210A-Time standaard and frequency station Guayaquil, Ecuador, heard at 0840 with time pips and Spanish voice announcements. (Lance Micklus, LEssex Junction, VT)

4034.8 Spanish female five digit number station noted at 0611. Transmission off by 0612. (Lance Micklus, Essex Junction, VT)

4054.0 FUF-French Naval Radio, Fort de France, Martinique, heard at 0848 with a "V" CW marker. (Lance Micklus, Essex Junction, VT)

4066.1 USS Kidd, DDG-993 calling Norfolk ICSB (Inter Command Switchboard) at 0145 in USB. The Kidd was enroute fleet week and patch was through NAVCAMSLANT (Naval Communications Area Master Station Atlantic) (Andy Gordon, West Hartford, CT) Probably used NAVCAMSLANT Norfolk-ed.

USS Arthur W. Radford, DD-968, calling Norfolk ICSB at 0045 in USB. Phone patch was made to the duty officer, Commander destroyer squadron 10 (COMDESRON 10). (Andy Gordon, West Hartford, CT)

4255.0 CFH-Canadian Forces Halifax, Nova Scotia, Canada, at 0853 with a CW "V" marker. (Lance Micklus, Essex Junction, VT)

4271.0 FUJ-French Naval Radio Noumea, New Caledonia, with a "V" CW marker at 0837. Noted brief traffic at 0840. (Jim Boehm, San Antonio, TX) Welcome back, Jim and thanks for the report-ed.

4274.8 HPP-Inteimar Radio, Panama, transmitted the following CW broadcast at 0847, "VVV VVV de HPP HPP-Inteimar Radio announces new operations schedule due to special national circumstances FM 1300 UTC to WPRPP UTC. Sorry for any inconveniences caused to our customers Tks AR." Seems Noriega's capers are affecting international shipping comms. (Jim Boehm, San Antonio, TX) Jim, not really sure what the WPRPP is. Anybody want to take a shot at this.

4294.0 WNU31-Slidell, LA, with the following CW marker, "CQ de WNU31 QSX 4 6 8 MHz OBS?." Transmission monitored at 0812. (Lance Micklus, Essex Junction, VT)

4305.0 JNA-Japanese Naval Radio Tokyo, Japan, heard with a CQ CW marker at 0845. (Jim Boehm, San Antonio, TX) Nice catch, Jim, not often heard-ed.

4366.0 CCM-Naval Radio Magellenes, Chile, at 0847 with a "V" marker in CW until 0855 then into "CQ CQ CQ SYNOP SYNOP SYNOP" for one minute. This was followed by five digit weather coded traffic until 0914. (Jim Boehm, San Antonio, TX) Another nice catch, Jim, not often heard-ed.

4388.4 WOO-Ocean Gate Radio, NJ, running phone patches to the ship Taurus. Talked about the crab fishing business at 0405. Transmission in USB. Ship side of the conversation on 4094.0. (Lance Micklus, Essex Junction, VT)

4428.7 NMN-U.S. Coast Guard Radio Portsmouth, VA, transmitting a high seas weather broadcast for 10 minutes. Noted in USB at 0530 and was parallel to 8765.4. (Lance Micklus, Essex Junction, VT)

4780.6 CW station sending five figure groups in sets of 6. Each set is different. Transmission heard at 0725. (Lance Micklus, Essex Junction, VT) This is Federal Emergency Management (FEMA) station WGY912 MT weather, VA, Lance. They send slow speed encrypted CW on this FEMA channel (14) often-ed.

4956.5 KKN39-U.S. Department of State Radio Washington, DC, heard at 0816 with the following CW marker, "QRA de KKN39 QSX 4/13/17."

5097.0 CFH2-Canadian Forces Station Halifax, Nova Scotia, heard at 1124 in CW with a frequency list. (Lance Micklus, Essex Junction, VT)

5182.0 Spanish female number station monitored at 0608 and 1011. Modulation was poor during the 0608 broadcast. (Lance Micklus, Essex Junction, VT)

5547.0 Aeroradio ATC-San Francisco, CA, working United 30. Aircraft gave a position report and fuel remaining. Transmission exchange at 0317 in USB. (Trevor Stanley, Flagstaff, AZ) Welcome back to the column, Trevor. This is s central east Pacific area aero network-ed.

5550.0 Aeroradio ATC-New York, NY working American 837. Aircraft gave a position report at 0245 in USB. (Trevor Stanley, Flagstaff, AZ) This is a Carribean area aero network-ed.

5616.0 Aeroradio ATC-Gander, Newfoundland, Canada, working TWA 754 at 0340 in USB. Aircraft passed a position and altitude report. (Trevor Stanley, Flagstaff, AZ) This is a north Atlantic area aero network-ed.

5658.0 Aeroradio ATC-Khartoum, Sudan, working an UNID aircraft in English at 0056. Mode was USB. This is the Africa-3 aero area network.

5762.0 Spanish female number station transmitting four digit groups at 0612. Better modulation than heard on 5182.0. (Lance Micklus, Essex Junction, VT)

5917.0 AOK-Spanish Navy/US Navy, Rota, Spain, with CW marker at 0354. (Russ Oder, Orange Park, FL)

6256.9 UHQS-Akademik Korolev, Soviet Hydromet weather research ship based in the Pacific with aviation weather reports to RNO, Moscow Radio in RTTY 170 HZ shift/50 baud. (Sam Ricks, Philadelphia, PA) Welcome to UTE World, Sam. Glad to have you on board-ed.

6269.5 UUVO-Kosmonaut Vladimir Komarov, Soviet spaceflight tracking ship enroute to Rotterdam with Russian telegrams to Odessa Radio UFB at 0350 in RTTY. 170 HZ shift/50 baud. (Sam Ricks, Philadelphia, PA) Sure have a lot of birthdays aboard those vessels, Hi, Hi-ed.

6410.0 7TF-Algeria, heard with a CW marker at 2355. QSX frequencies at 6/8/16 MHz. A lot of fading so gave up. (Mel Smith, Crisfield, MD) Welcome to the loggings section, Mel. 7TF is definitely in Algeria but exactly where has still not been confirmed. Nice catch on 6 MHz for that time of day-ed.

6430.0 UNID station sending 4 figure groups of letters and numbers in CW at 1214. (Lance Micklus, Essex Junction, VT) More than likely, Lance, this was CFH-Canadian Forces Radio in Halifax, Nova Scotia, Canada, on with a weather report broadcast-ed.

6492.5 KFS-San Francisco Radio, CA, at 1130 in CW. Transmission stated that SITOR now in service. (Fred Hetherington, Ormond Beach, FL)

6515.7 Monitored "Racine Locks" ship traffic at 0244 in LSB. (Harold Frodge, Midland, MI) Thanks for the loggings Harold, report often-ed.

6750.0 USAF GCCS MacDill AFB, Florida, transmitting an encoded message followed by an aviation weather report at 0400 in USB. (Trevor Stanley, Flagstaff, AZ)

6753.0 UNID Canadian Forces station on at 0422 with an aviation weather report in USB. (Trevor Stanley, Flagstaff, AZ)

Canadian Forces Edmonton Military, Alberta, Canada, heard with an aviation weather forecast at 0223 in LSB. Weather reports transmitted for northern Canada and Greenland. (Harold Frodge, Midland, MI)

7630.0 TTL-Asecna N'Djamena, Chad, sending FTTJ meteo RTTY messages to Niamey 170 HZ shift/50 baud speed/normal sense. (Fred Hetherington, Ormond Beach, FL)

7825.65 VMA-Diggersrest, Australia, (near Melbourne) 85 HZ shift/75 baud speed/reverse sense RTTY signal sending Foxes, Count, test de VMA for Irirangi, New Zealand (100 miles north of Wellington). Monitored here for several weeks but always encrypted. Finally caught them in the clear. Strong signals. Other VMA channels logged include 7810, 8115, 9850, 10105.5, 10465, 12083, 12085 and 22490. Powerful station. (Fred Hetherington, Ormond Beach, FL)

7887.0 Spanish female number station noted at 0605. Transmissions quality like a local. (Lance Micklus, Essex Junction, VT)

8014.5 BCQ21-PTT Shanghai, PRC monitored at 1900 in RTTY with a Quick Brown Fox test tape. 850 shift/50 baud speed/reverse sense. (Lance Micklus, Essex Junction, VT)

8051.5 WOO-Ocean Gate Radio, NJ, monitored with the following transmission using SITOR-B at 1225. (Lance Micklus, Essex Junction, VT) See the first part of this month's column for the text that was sent and more information on this broadcast-ed.

8123.1 TNL96-Brazzaville, Congo, with a 425 HZ shift/50 baud/reverse sense RTTY signal sending RYs CQs de TNL96/TNL97, RYs then meteo reports. This station used to sign TNL48 and is still so registered with the ITU. Have searched many times for the elusive TNL96 when the station on 10137 signs TNL96/TNL97 which happens every day. I will list TNL96 on this frequency until we know otherwise. (Fred Hetherington, Ormond Beach, FL)

8125.0 UNID slow speed CW station repeated XXXXX ten times in his short message. Station transmitted for 20 minutes and was very slow and sloppy. In fact MT computer had problems reading him. This is the

second Sunday I copied this station around 1100. (Mel Smith, Crisfield, MD)

8140.0 CLN219-Prensa Latina News Service, Habana, Cuba, at 0952 with an English RTTY news broadcast. 850 HZ shift/50 baud speed/reverse sense. (Lance Micklus, Essex Junction, VT) That transmitter starts transmission at around 0900-ed.

8151.7 HMF86-KCNA Pyongyang, North Korea, with English news at 1020, signoff occurs at 1050. Strong signal here. (Fred Hetherington, Ormond Beach, FL)

8169.33 T5M and H2H both using 85 HZ shift/45 baud/reverse sense RTTY. Simplex operation. English messages read as if it was a military exercise. USAF mentioned. Off the air by 0018. (Fred Hetherington, Ormond Beach, FL) Probably US Navy unit, Fred. They even work voice to set things up before they start RTTY ops. The callsigns are indicative of Navy callsigns-ed.

8297.5 UTDX-Kosmonaut P. Belyayev, Soviet spaceflight tracking ship with Russian telegrams to Leningrad at 0049. Transmission mode was RTTY 170 HZ shift/50 baud. (Sam Ricks, Philadelphia, PA)

8298.5 UISZ-Akademik Sergei Korolev, Soviet spaceflight tracking ship enroute to Rotterdam with Russian telegrams to UFB, Odessa Radio using RTTY at 170 HZ shift/50 baud. (Sam Ricks, Philadelphia, PA)

8342.5 UFIJ-Akademic M. Keldysh, Soviet oceanographic research ship monitored sending Russian telegrams to Klaipeda Radio URB-2 in the RTTY mode. 170 HZ shift/50 baud. (Sam Ricks, Philadelphia, PA)

8346.0 UBLF-Akademik Kurchatov, Soviet oceanographic research ship transmitting Russian telegrams to Odessa Radio at 0200 in the RTTY mode. 170 HZ shift/50 baud. (Sam Ricks, Philadelphia, PA)

8420.0 English female number station at 2300. Last heard this station in May 1987 on 5090 and 6840. This station would come up with a carrier at 2245 then start the transmission at 2300. One May afternoon the station came up with Spanish numabers, then realized their mistake and came back in English. Found a parallel transmission on 10460.0. (Mel Smith, Crisfield, MD)

8458.0 78IJU-Spanish Naval Radio Madrid, Spain, with a RTTY 850 HZ shift/100 baud/reverse sense transmission. Station sent RY for observation at 75RQA. "75RQA de 78IJU 4/6/8/12 RG RY RY." Unusual baud rate for this station which last month signed "98OQJ." (Fred Hetherington, Ormond Beach, FL) Unusual baud rate for an unusual station, Fred-ed.

8765.4 NMN-U.S. Coast Guard Radio Portsmouth, VA, transmitting a high seas weather broadcast for 10 minutes. Noted in USB at 0530 and was parallel to 4428.7. (Lance Micklus, Essex Junction, VT)

8894.0 Aeroradio ATC-Algiers, Algeria, working EL AL 674, Caledonia 306/366 and hostage aircraft Kuwaiti Airlines Flight 422 at various times from 0105 to 0200. 422 was on it's way to Algiers after leaving Cyprus. Transmission monitored was a routine position report by an obviously tired crew member. Transmissions were in USB.

9015.0 UNID RTTY station monitored with a strong signal between 1000-1100+. 170 HZ shift/73 baud speed/normal sense. My mystery station of the month. (Fred Hetherington, Ormond Beach, FL)

9027.0 SAC-UNID station monitored at 2045 in USB with a Skyking EAM broadcast. (Trevor Stanley, Flagstaff, AZ) This is a SAC channel Romeo-ed.

9274.0-9276.4 VDD-Halifax, Nova Scotia, sending VFCT, all channels 75 baud/170 HZ shift and all carrying Fox test tape. Testing to Ottawa and off at 2044. At 2100 back on the air, but now half the channels were encrypted and half readable here using Fox test tapes. Appears the later test enables comparision. (Fred Hetherington, Ormond Beach, FL)

9305.0 BCW30-Shanghai, PRC with RTTY RYs, QRAs and ZHCs. Off at 1200 without the usual contact with Habana. 425 HZ shift/50 baud/reverse sense. (Fred Hetherington, Ormond Beach, FL)

9318.0 DHJ51-Grengel Meteo, West Germany with RTTY signal, 425 HZ shift/100 baud/normal sense. RYs and CQs then into meteo traffic. First time logged here using 100 baud. (Fred Hetherington, Ormond Beach, FL)

10051.0 Volmet-New York Radio with aviaton radio weather transmissions at 0409 in USB. (Russ Oder, Orange Park, FL)

10233.0 USIA (VOA)-Bethany, Ohio, broadcasting an English news summary at 2227 in RTTY. 170 HZ shift/75 baud speed/reverse sense. (Lance Micklus, Essex Junction, VT)

10380.8 USIA (VOA)-Bethany, Ohio, transmitting English book reviews at 1135 in RTTY. Sign off at 1200. 170 HZ shift/75 baud speed/reverse sense. (Lance Micklus, Essex Junction, VT)

10382.2 USIA(VOA)-Bethany, Ohio, transmitting English cultural news at 1130 in RTTY. 170 HZ shift/75 baud speed/reverse sense. (Lance Micklus, Essex Junction, VT)

10854.5 CBIFA-Chile, with a new RTTY frequency in the "Todos Bucaneros" Chilean net. T170 A/B (SFA) at 2230/2300/0030. (Fred Hetherington, Ormond Beach, FL)

10859.2 YAD4-Kabul, Afghanistan, monitored sending RTTY messages in English to New Delhi. 340 HZ shift/50 baud/normal sense. (Fred Hetherington, Ormond Beach, FL)

11239.0 USAF GCCS McClellan AFB, CA, transmitted a list of frequencies at 2100 in USB. (Trevor Stanley, Flagstaff, AZ)

11148.5 CBFFA-Chile (SIA) "CBIFA de CBFFA" send in RTTY then into coded message groups at 0150. Another frequency in the "Todos Bucaneros" Chilean Military Communication System which now has about as many frequencies as the French Naval "RF---" net. There must be an interesting story there!! (Fred Hetherington, Ormond Beach, FL) Probably is, Fred, Maybe we can get that story-ed.

12212.3 YZO3-TANJUG Belgrade, Yugoslavia, monitored at 0530 with English a news RTTY broadcast. 170 HZ shift/50 baud speed/normal sense. (Lance Micklus, Essex Junction, VT) TANJUG is the Yugo news service and stands for "Telegrafska Agencija Nova Jugoslavija"-ed.

12514.9U MFW-Professor Zubov, Soviet hydromet weather research ship sending aviation weather reports to RNO, Moscow Radio at 2015. Transmissions utilized RTTY at 170 HZ/50 baud. (Sam Ricks, Philadelphia, PA)

12523.0 UIVZ-Kosmonaut Vladislav Volkov, Soviet spaceflight tracking ship enroute to Rotterdam sending Russian telegrams to Leningrad at 0100 using RTTY 170 HZ shift/50 baud. (Sam Ricks, Philadelphia, PA)

12525.9 UKFI-Kosmonaut Yuriy Gagarin, Soviet spaceflight tracking ship sending RTTY Russian language telegrams to Leningrad at 2056. 170 HZ shift/50 baud. (Sam Ricks, Philadelphia, PA)

13440.0 YZJ5-TANJUG Belgrade, Yugoslavia, monitored at 1335 with RTTY English news. Poor copy, weak signal. 425 HZ shift,75 baud speed/reverse sense. (Lance Micklus, Essex Junction, VT)

13387.0 KKN39-U.S. Department of State Radio, Washington, DC, with a CW QRA/QSX marker. Gave the following frequencies 4956.5, 17413.0, 13387.0. Transmission noted at 2215. (Mel Smith, Crisfield, MD)

14512.9 AEM1USA-Heidelberg, West Germany, army MARS station sending RTTY RYs by the ream at 1111. 170 HZ shift/45 baud/reverse sense. (Fred Hetherington, Ormond Beach, FL) Not to worry, Fred. The government buys it cheaper by the ream.-ed.

14619.0 Y7A59-MFA Berlin, DDR, monitored at 1753 with a RTTY transmission. Broadcast consisted of five-letter groups. Traffic list?? (Lance Micklus, Essex Junction, VT) Probably encrypted traffic, Lance. MFA stands for "Ministry of Foreign Affairs"-ed.

14630.5 ISX46-ANSA Rome, Italy, now has with RTTY news in French at 1145 and English news at 1035. 425 HZ shift/50 baud/normal sense. (Fred Hetherington, Ormond Beach, FL)

14932.2 AAA6USA-Fort Sam Houston, TX, army MARS with English RTTY messages until 2100 then off. 170 HZ sense/75 baud/reverse sense. (Fred Hetherington, Ormond Beach, FL)

15890.0 RBI79-TASS Moscow, USSR with RTTY news in Portuguese at 1335. 425 HZ shift/50 baud/reverse sense (changed from 850 shift) Fred Hetherington, Ormond Beach, FL)

17015.0 UJQ-Kiev Radio with 170 HZ shift/75 baud Russian RTTY messages at 1345. Messages all datelined Odessa (Cyrilic). Started CW mode at 1400 signing UJQ. Very unusual to catch UJQ on RTTY on this frequency, usually in CW. (Fred Hetherington, Ormond Beach, FL)

17030.5 GYA-Royal Navy London, England, with a new RTTY frequency, parallel to 22454.3. Transmission noted at 1445 with an unique test pattern. 850 HZ shift/75 baud/reverse sense. (Fred Hetherington, Ormond Beach, FL)

17160.0 CLA-Habana Radio, Cuba, with traffic in CW at 2140. Personal notes to another station I could not hear. CLA also mentioned 7FMSA (???) four times. (Mel Smaith, Crisfield, MD)

19031.5 OST68-Oostende Radio, Belgium, with a FEC sports brief that ends at 1227. At the same time, OST67-Oostende on 19021.0 is chirping away with traffic to ships. (Fred Hetherington, Ormond Beach, FL)

19980.0 EPJ2-IRNA Teheran, Iran, with RTTY English news now on later at 1520. Broadcast gave war news. 425 HZ shift/50 baud/reverse sense. (Fred Hetherington, Ormond Beach, FL)

20015.0 NAM-U.S. Navy Norfolk, VA, with a FAX weather chart at 1230. Signal was strong and parallel to 3357.0.

20734.0 CLP45-Luanda, Angola, relaying Spanish RTTY messages from CLP44-Harare Embacuba, Zimbabwe to Minrex, Habana at 1620. 500 HZ shift/50 baud/ normal sense. (Fred Hetherington, Ormond Beach, FL)

20754.44 ARQ transmission. International Committee Red Cross long message in English concerning wounded combatants in hospitals in Mozambique. Beira and Loki mentioned. Klingenfuss Utility book shows an ICRC station in N'Djamena (TTR88) on this frequency, but this one may be in kMozambique. At 1446 switched to French with three messages to Maputo. At 1443 called HBVXHBVXHBVXHBVX (might start with X, V, B, or H but, I suspect H and this was a call to Berne. (Fred Hetherington, Ormond Beach, FL)

22326.0 IAR-Rome Radio, Italy, heard at 1812 with a CW "V" marker signal. (Lance Micklus, Essex Junction, VT)

22390.0 FUF-French Naval Radio Fort de France, Martinique, noted at 1815 with a CW "V" marker broadcast. (Lance Micklus, Essex Junction, VT)

22509.0 FFL-Saint LYS Radio, France, transmitting a CW traffic list at 1835. (Lance Micklus, Essex Junction, VT)

22593.0 ZSC-Capetown Radio, South Africa heard at 1237 with a DE CW marker.

23145.0 CLP45?-Luanda, Angola??, received several RTTY Spanish messages with headings from Maputo and Harare to Minrex, Habana, at 1500. 520 HZ shift/75 baud speed/normal sense. (Fred Hetherington, Ormond Beach, FL)

MT Ute Contest!!!

Yep, you read it right. Several column readers have suggested we have a contest. Well, let's do it! We'll have more information over the next couple of months so keep an eye out! In the meantime, I would appreciate your thoughts, ideas and comments on this subject. Who knows, we might even persuade head honcho Bob Grove to donate some of the prizes. So let me hear from you.

Scanning the Nation

Bob Kay
104 Bonsall Avenue
Glenolden, PA 19036

Looking for the Smart Scanner

If scanner manufacturers were smart, they would produce a scanner that would be compatible with a Commodore 64 or 128. Publishers of frequency directories would follow with disks that were programmed to various areas around the country.

Imagine inserting a disk into your Commodore that would instantly control your scanner and enter all the active frequencies for a given area. When a police officer went in "hot pursuit," you could type in the street, and the computer would instantly project a city map -- allowing you to follow the action.

I can visualize all your heads nodding in agreement as I write this. Most of you are already using computers -- very rarely do I receive a frequency list that is hand written. Some of you have even gone so far as to send booklets with computerized graphics on the cover. It's just amazing -- to me anyway -- that the scanner manufacturers haven't followed the trend.

I am also amazed by the number of readers that have sent me information for this column and who have requested anonymity. Still others, not quite sure of my integrity, have sent information with no return address or name.

Some of you have assigned yourself some rather creative code names. For example: In California there is an individual who sends info under the code name, "Ear Tweeker." In Florida, mail arrives from the "Frequency Freq." Others have chosen initials; Mr. "SH" in North Dakota, and PZR in North Carolina. The list could go on, but I think you are beginning to get the picture.

Of all the material received, I would be hard pressed to consider any of it as being sensitive. It would be nearly impossible to label it as confidential. But many of you no doubt think otherwise.

So, for all the secret listeners out there, I welcome your material and your code names. Going to my mail box has truly become nothing less than an adventure! Thanks for your enthusiasm.

Diskettes Are Forever

The U.S. Navy is warning its computer operators that old diskettes should be cut or burned. Deleting or erasing diskettes does not destroy the data, it only logically eliminates it from the active file table. With professional recovery equipment, these files can be recovered.

Protecting Canada's Environment

The Environmental Protection Agency of Quebec Province can be monitored on 148.655, 148.685, 148.720, 149.410, 149.470 and 149.525 MHz. (Submitted by Gilles Thibodeau, Quebec, Canada)

Radio Controlled Mines

The "Modular Pack Mine System" (MOPMS) is the Army's first radio controlled electronic battlefield mine. The mine electronics package is the size and shape of a hockey puck and is encased in polyurethane. It has over 100 components including state of the art integrated circuits.

The remote-to-mine frequencies are said to be secure and encoded. From our point of view, we certainly hope so!

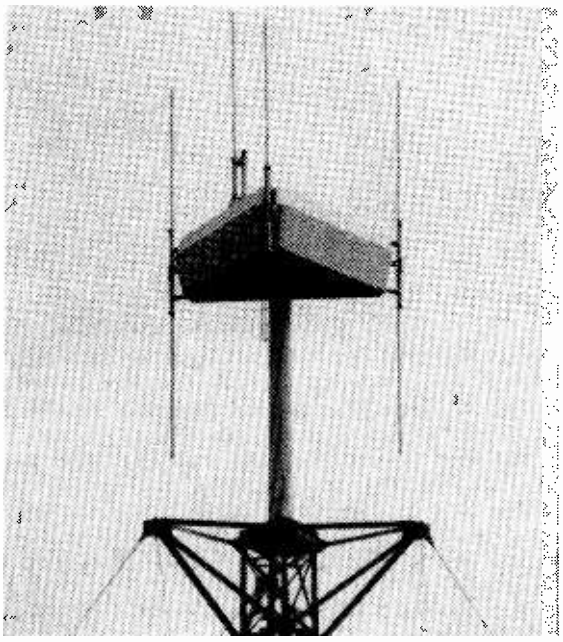
Maryland State Police Frequencies

From Washington, D.C., Jim Thompson sends us this list of State Police frequencies in his area, plus a key to know who you'll find on each frequency.

39.100	(F-1)	Statewide Intersystem
39.260	(F-2)	Mutual Aid
39.300	(F-3)	Barracks (I&Q)
39.340	(F-4)	Barracks (D,L&O)
39.140	(F-5)	Barracks (J)
39.320	(F-6)	Barracks (N&S)
39.380	(F-7)	Barracks (K,R&T)
39.240	(F-8)	Barracks (C,H&V)
39.520	(F-9)	Barracks (G&U)
39.040	(F-10)	Barracks (P)
39.060	(F-11)	Barracks (A&E)
39.400	(F-12)	Barracks (B&F)
39.220		Marine Police
39.660		Bureau of Criminal Investigation
44.740		Interstate Channel for MD,VA, and PA
151.040		Barracks (M) I-95 Patrol
155.190		Barracks to Barracks frequency
155.730		Portable extender

State Police barracks and counties covered

A Howard
B Frederick
C Allegheny and Garrett
D Harford
E Wicomico
F Cecil
G Carroll
H Charles
I Caroline, Dorchester and Talbot
J Anne Arundel
K Baltimore-Southwest
L Prince George-South
M I-95
N Montgomery
O Washington
P Department of Motor Vehicles
Q Prince George-North
R Baltimore-North
S Kent, Queen Anne's
T Saint Mary's
U Calvert
V Somerset, Worchester



Called "Mobile Subscriber Equipment," MSE can handle voice, data and facsimile transmissions. The MSE is expected to support the entire regular Army and Reserve units with fully encrypted, jam resistant, mobile tactical phone service.

Cellular Phones -- Army Style

Called "Mobile Subscriber Equipment" (MSE), they can handle voice, data and facsimile transmissions. Developed by GTE, Raytheon and RCA, the MSE is expected to support the entire regular Army and reserve units with fully encrypted, jam resistant, mobile tactical phone service.

The first MSE is expected to be put into use at Fort Hood, Texas. The system should be operational by the time this column is printed.

Yes, Virginia, There Are Flying Saucers

The U.S. government is currently experimenting with several miniature flying saucers that can carry camera equipment aloft, so that ground troops can see over the "next hill."

The saucers vary from small units only a few feet in diameter to the ten foot, electric powered saucer that can hover for up to an hour and zip along at speeds up to 125 miles per hour!

The larger saucers are powered by up to eight electric fans and can carry 600 to 900 pounds of equipment. Here at *MT*, we can only speculate on the number of "UFO" sightings that may have been caused by these government operated saucers.

New Jersey Troopers are Moving Up

State Police in New Jersey are leaving their low band (44.0 MHz) operation for the 800 MHz trunked system. The repeater out frequencies are: 860.9625, 859.4625, 859.9625, 858.9625, 857.9625 and 856.9625 MHz. (Submitted by James Richards, Hackettstown, New Jersey)

Recruiting Spies from the Help Wanted Column

A woman who placed a job-wanted ad in a newspaper was recruited as a communist spy and trained to photograph secret documents with a camera disguised as a cigarette lighter. The film was then hidden in a can of hair spray. Communications were carried out with a small transmitter that resembled a cosmetic case.

The woman, who worked as a secretary in West Germany, had access to very confidential and secret documents in the ministry of West German Intelligence Agencies.

They Dive but They Can't Hide

The updated version of the Lockheed P-3C Orion (a high tech computerized noise scanner) is five times more sensitive to modern Soviet submarine noise. The improvement was necessary to monitor the quieter Sierra-class Soviet subs.

In addition, the update has eight times the bulk data storage capacity, thirty times as much memory and has a success rate of 97 percent.

The Navy plans to buy over 200 of the updated units and place them in long range aircraft.

Cordless Phones in Court

A fireman in Florida taped a cordless telephone conversation between two city commissioners that led to charges that the commissioners violated the state's "open meeting law." The state attorney charged that the commissioners discussed public business without notice of a meeting and without keeping a record of the discussion.

After a 119 page transcript of the chat was admitted into evidence, Florida's governor, Bob Martinez, suspended the two commissioners pending the outcome of the trial. If convicted, the pair could spend 60 days in jail and receive a $500.00 fine.

A defense attorney stated that the trial will "focus on the privacy issue and the use of a scanner to invade that privacy." (Article submitted by John F. Combs, Jacksonville, Florida. Hopefully, John will inform *MT* readers of the trial results!)

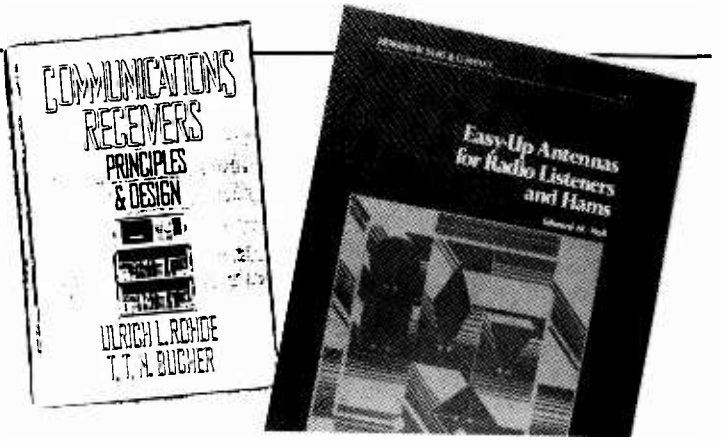
The Six Million Dollar Climb

Henrico County, Virginia, is considering a regional 800 MHz system which could make communications between surrounding counties easier.

If approved, the system is expected to cost between four and six million dollars. Initial implementation would be late in 1989. Currently, Henrico County Police operate between 460.150 and 460.450 MHz. Fire and special forces operate between 154.025 and 156.210 MHz. (Submitted by Richard Rowland, Richmond, Virginia)

Send all scanner-related information to the address above and let us know what you have heard on <u>your</u> scanner!

what's new?



North American Television Database

By the Worldwide TV FM DX Association

Being able to tune in signals from the other side of the planet is nothing new to people who listen to shortwave. So why all the excitement over TV DX? Frankly, I can't explain it. I do remember my first long distance TV "catch," however. I was watching the excellent PBS TV show, *Nova*, on my cheapie black and white with rabbit ears. There was only one thing odd about it. *Nova* was coming in on channel 2 and there is no channel 2 in Philadelphia. A moment later, the station ID, showing as clearly as any local channel, was on the screen: WPBT, Miami, Florida.

From that moment on, I was hooked. And while I don't spend gross amounts of time sitting in front of the TV screen watching snow on vacant channels in hope of a catch, I do periodically do a little scanning. The rewards are as satisfying as any shortwave catch, perhaps more so because of TV DXing's unpredictability.

Interested? Then you'll want to get the full rundown on a club called WTFDA (Worldwide TV-FM DX Association. Not only do they publish an excellent monthly bulletin on TV and FM DXing, but they also offer the absolutely superb *North American Television Data Base*. *NATDB* lists all North American TV stations (including Canada, Mexico and the Caribbean) by channel number and by state.

Monitoring Times readers can get more information on WTFDA and a sample issue of their bulletin by sending one dollar to Worldwide TV-FM DX Association, P.O. Box 514, Buffalo, NY 14205-0514.

FM Atlas

By Dr. Bruce Elving

As well thought out, comprehensive and close to perfection as a book can be. That's an apt description of Dr. Bruce Elving's new 11th edition of *FM Atlas and Station Directory*. No tired, old hobbyist's handbook, *FM Atlas* has, over the years, reached a level of usefulness that takes it simultaneously into the realm of both professional guide and truly user-friendly listener's directory. Over 480 new stations have been added since the 10th edition came out some 20 months ago.

Like Gideon's Bible, it should be in the night table drawer of every hotel room in North America. For travelers, maps of each state and Canadian province show what stations can be heard in what cities and on what frequencies. The same information is also provided in a handy list format, organized by state and city. And, for the DXer, yet another list is presented in frequency order for quick ID of stations heard.

So, whether you're just an average, everyday FM listener, a traveler, or one of that peculiar breed seeking out exotic FM signals, *FM Atlas* is a must. You can order your *FM Atlas* directly from Dr. Elving for $9.95 plus $1.95 shipping and handling. The address is simply, FM Atlas, Adolph, MN 55701. Be sure to tell the good doctor that *Monitoring Times* sent 'ya.

Primetime: Network Television Programming

by Richard A. Blum and Richard D. Lindheim

Primetime television programming is the central and perhaps most competitive activity in American broadcasting. And *Primetime*, the book, provides the first behind-the-scenes look at how the networks develop their programming. This is a *fascinating* book. And when they say, "behind-the-scenes," they really mean it. Chapters are illustrated with actual scripts of shows like *Miami Vice* and professionals discuss with unusual candor, the audience and how they try to capture them.

Paul Klein, former head of programming at NBC calls the book, "The most comprehensive and insightful book ever written on the full scope of programming. I wish that this text had been available when I was breaking in [to the business]. If it had been, I never would have done "Supertrain."

Whether you love TV or hate it, *Primetime* comes highly recommended. *Primetime* is available from Butterworth Publishers, 80 Montvale Avenue, Stoneham, MA 02180 for $19.95 plus $2.37 UPS.

Communications Receivers Principles and Design

by Ulrich L. Rohde and T.T.N. Bucher

If you've been reading up on receivers lately, you will have been impressed by two things: first, there have been many changes in receiver design over the last few years; and second, Ulrich Rohde's name inevitably comes up when serious receiver design is the topic.

Many hobby publications have tried to compare the new receivers on the market. Often, the standards of comparison are largely judgmental, dependent upon the biases of the reviewer as to what constitutes a "good" radio. Some publications do a credible job in their recommendations while others are suspect in their expertise.

Admittedly, the standards of criterion in the first chapter of Rohde and Bucher's text are the Rohde and Schwarz EK-070 and ESM-1000 professional receivers. While this may appear grossly self-serving, the receivers are models of competent design. The remainder of the book evolves unbiased, discussing design goals in more absolute terms.

Communications Receivers is not an easy read; rather, it is intended as a hard-core textbook for the RF design engineer. Many mathematical derivations and equations are included (mercifully sparing us, however, from differential and integral calculus!) and specimen schematics abound.

The book evolves as would the block diagram of a receiver: from antenna input to audio, including signal coupling techniques, RF amplifiers, mixers, oscillators, demodulators, specialized modes, trends in receiving design, general receiver considerations and characteristics, and signal path planning.

Extensive illustrative material helps explain concepts; graphs, charts, schematics, tables, references and formulas are liberally sprinkled throughout the work. Not for the fainthearted, *Communications Receivers* is intended for the engineer.

(583 pages, 6" x 9", hardbound; $69.95 postpaid from Ham Radio Bookstore, Greenville, NH 03048)

Easy-Up Antennas for Radio Listeners and Hams

by Edward M. Noll

Readers of *MT*, *PopCom* and the ham magazines will immediately recognize the name Ed Noll as being among the most prolific writers in the radio hobby. Antennas are his hobby and Ed has amassed considerable information on them.

There are bound to be several antenna projects in in Ed's new book that will catch your eye. How about a directional wire beam for HF to zoom in on that elusive DX station? Have you thought of a multi-position switch to select combinations of wires for various patterns? How about using TV antennas for VHF and UHF scanner reception?

The book is liberally illustrated; newcomers should have no difficulty understanding its concepts and procedures. Fundamentally organized into listening or ham antennas, chapters include comparisons, verticals, wire and beam antennas, special purpose, medium and longwave, limited space, VHF/UHF, tuners, dipoles, multiband, loops, slopers, mobile, rhombics and Beverages.

There are other types as well, even a chapter showing dimensions for scaling antenna measurements for different frequencies. About the only thing missing from the book is a discussion of grounding, a curious omission. But the antenna hints are excellent and will provide endless hours of enjoyable experimentation as well as satisfaction in use.

(162 pages, 8-1/2" x 11", perfect bound; published by Howard W. Sams and available for $16.95 plus $2 shipping from Ed Noll, P.O. Box 75, Chalfont, PA 18914)

Sloper Price Hike

Antenna Supermarket, the manufacturer of the popular Eavesdropper line of shortwave antennas, has announced a $14.55 price rise on their sloper. The new price of the antenna is $64.50. For more information, contact your favorite shortwave store or write to Antenna Supermarket at P.O. Box 563, Palatine, IL 60067.

IRI Bank Controller I for Kenwood TS-940

International Radio, Inc. has announced the addition of a new product to their line of useful Kenwood accessories. The IRI Bank Controller I allows front panel memory bank control on the Kenwood TS-940S, thus eliminating the need to open the slide hatch when you want to change the memory bank. The unit is a direct, plug-in substitute for the Voice Synthesizer and allows use of the front panel "voice" button to step through all four memory banks.

The IRI Bank Controller I is available for $24.95 plus $5.00 shipping from International Radio, Inc., 751 South Macedo Blvd., Port Lucie, Florida 34983.

To have your new product or book considered for review in Monitoring Times, send it to Editor, 140 Dog Banch Road, Brasstown, NC 28902.

Second Scanner for Ace Communications

Ace Communications has announced the introduction of a new miniature mobile scanner with frequency synthesized keyboard control. The AR160 is the second new receiver to be released by ACE this year.

The AR160 weighs in at just 25 ounces and measures 1.5" in height, 4.62" in width and 6.5" in depth. All the conventional police, fire and emergency bands are covered: 29-52 MHz, 136-174 MHz and 436-512 MHz.

The suggested retail price for the AR160 is $189.00 and comes complete with DC power cable, telescopic whip antenna, mobile mounting bracket and DC to AC converter for indoor use. For more information, write to Ace Communications, Monitor Division, 10707 East 106th Street, Indianapolis, Indiana 46256 or call 317-842-7115.

Kenneth Vito Zichi

3018 Moyer Road
Williamston, MI 48894-9506

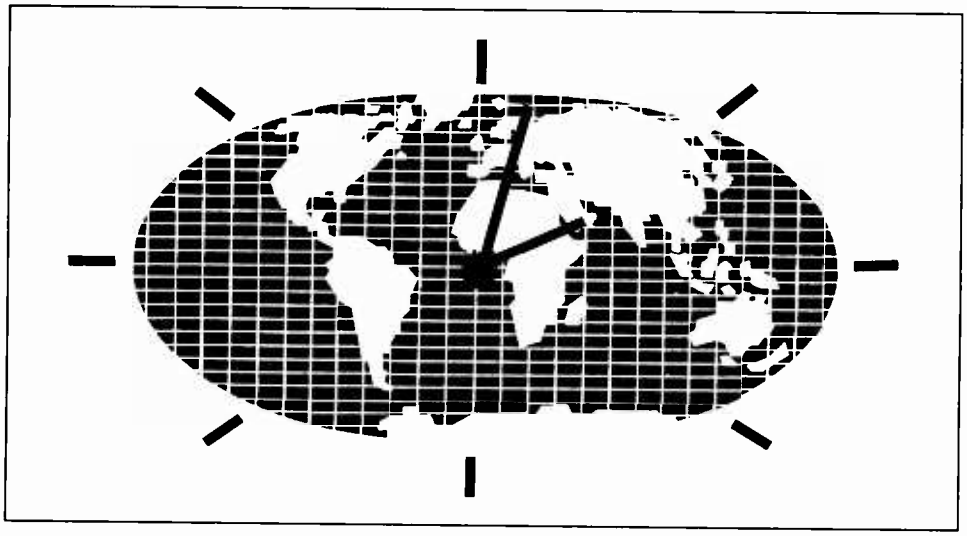
Telling Time

Telling time is something that kids now learn before they go to nursery school. But the radio hobbyist is faced with a rather perplexing situation the first time he hears a non-local broadcast station announce the time. If you tune your scanner to airline frequencies, or listen to international broadcast stations, you'll soon discover that the "time checks" used in both applications are not in your local time, but rather are in UTC instead.

Indeed, you will find that if you want to decipher international broadcast stations' schedules, it is necessary to master this "Coordinated Universal time." While this is a topic that can cause newcomers no end of confusion, in the end it is actually quite simple.

What is UTC?

To begin at the beginning, "UTC," or Coordinated Universal Time (the abbreviation comes from the French), represents the time standard for any activity that crosses time zones. Also, scientists and others interested in having a precise time standard use UTC, but often call it by some other name such as "Zulu Time," "Greenwich Mean Time (GMT) or "Universal Time" (UT).



Actually, you will still hear many radio hobbyists from the stone-age (like this columnist) who use the term "GMT" simply because, until a few years ago, GMT was the phrase used by WWV/WWVH -- the USA's time standard stations located in Colorado and Hawaii respectively, and broadcasting on 2500, 5000, 10000, 15000 and 20000 kHz. These stations now announce UTC and, slowly, hobby vocabulary is changing as well.

At any rate, UTC is simply the time at the Prime Meridian, usually expressed in 24-hour format (like the military). Actually, UTC is not exactly the same as Greenwich Mean Time (which is the time at the Prime Meridian). Since it is maintained by atomic clock, and therefore is very precise, UTC regularly needs "correction" to make up for variations in the speed of the earth's rotation.

Left to run on its own, "noon" UTC would eventually occur in the middle of the night, since the earth itself is not nearly as regular as an atomic clock! These variations are taken care of by inserting leap seconds at appropriate times, and by providing "correction factors" in between additions of leap seconds to keep UTC within a few milliseconds of "earth time." The point is that although there are subtle differences between GMT and UTC, the two are virtually identical for everyone other than scientists, and the terms are commonly used interchangeably.

Fortunately, using UTC/GMT is simpler than explaining how it is coordinated and calculated. All you need do is set a clock -- preferably, but not necessarily, a 24-hour clock -- to UTC. Like the metric system, it is easier to "think" in UTC than it is to try to convert back and forth on the fly between local time and UTC. Having such a clock will allow you to think in those terms. You then can tell at a glance what time it is -- in UTC -- and know when to catch your favorite programs.

But before we get into how to set that clock, we should back up a bit and get to the bottom of why UTC is necessary in the first place.

Why UTC?

Radio listeners refer to UTC instead of local standard time simply because referring to any one local time zone would ultimately be more confusing. You might consider UTC a sort of Esperanto for time: it allows people across the globe to easily determine the time of a given event unambiguously.

For example, if the announcer says a program will start on the BBC World Service at 8:00 p.m., does he mean 8:00 p.m. American Eastern Standard Time, Eastern Daylight Time, Central Standard Time, or Australian Eastern Time? It simply is not clear. However, if the same announcer says a program will start at 0000 hours UTC, listeners in America and Australia can both easily determine when to tune in.

One fine point that is often glossed over is how to figure the date in UTC, and indeed many stations add to the confusion by referring to local dates in the target area but quoting time in UTC. (Radio Canada is a prime example.) Despite the fact that many stations do not fully appreciate the fact, the date and day change at midnight in the time zone you are using. Therefore, if you are talking in terms of UTC, the date changes at 0000 hours, not at local midnight.

Conversion

Despite the fact it is easier to set a clock and forget about conversion, you do at some point have to set the clock, and for that purpose you will need to determine the proper UTC time. Chart one summarizes how UTC is related to the time zones in the continental USA. Other areas can find the appropriate conversion factor from the *World Radio TV Handbook* listing.

The best way to determine what time it is in UTC, however, is to listen to WWV or WWVH. One of these stations is audible

Chart One:
GMT as related to local time in the continental USA

	The time in:							
	PST	PDT	MST	MDT	CST	CDT	EST	EDT
is UTC	-8	-7	-7	-6	-6	-5	-5	-4 hours

Example: Sunday, 0500 UTC is:
9 p.m. PST (Saturday)
10 p.m. PDT and MST (Saturday)
11 p.m. MDT and CST (Saturday)
12 Midnight CDT and EST (Sunday and
1 a.m. EDT (Sunday)

Be sure to see the frequency section in this month's issue. The UTC conversions are already done for you!

almost around the globe, and both are easily heard in North America. In addition to not having to convert, you will find the time standard broadcast by these stations to be accurate to within a few parts per billion. You can't do better than that anywhere!

But what time is it in Australia?

Ah yes, the inevitable last question is, "That's all fine and good, but I'm curious to find out what time it is in Outer Symphonia. Why do I need to determine UTC first?" The simple answer is that all other time zones are figured relative to UTC. The real reason is to make sure you keep the date straight.

A concrete (and real) example should help. Suppose it is 8:00 p.m. Wednesday in New York. What time is it in Melbourne? Well, Australian Eastern Time is UTC plus 10 hours. American Eastern Time is UTC minus 5 hours, therefore, Melbourne is 15 hours ahead of New York, and it is 11:00 a.m. Thursday.

Note the subtle difference between saying 15 hours ahead instead of 9 hours behind. This explains that pesky little concept embodied in the International Date Line. Actually, the IDL is just the line on the earth's surface where UTC plus and UTC minus time zones meet, and consequently, the date must also change there.

If you remember that all the world's time zones are figured relative to UTC, you can safely ignore the IDL, and still come out okay, since if you run past midnight when figuring time relative to the Prime Meridian, you know the date has to change.

Daylight Time

There is one last point you need to know before you are fully versed in UTC, and that relates to Daylight Savings Time (or Summer Time as it is known in many parts of the world). Briefly, and as outlined in chart one, UTC does not change for Summer Time.

As a result, the UTC time appears to shift with the bi-annual change from Winter Time to Summer Time and back, and you will need to make mental note of the fact that programming that has not changed UTC time will be on at a different local time than before. Unfortunately, to complicate matters, many SW broadcast stations (such as Kol Israel), and most nonbroadcast stations, shift their UTC schedules to coincide with the local switch to Summer Time. This means the program is on at a different UTC time, but the same local time as before.

Summary

That was a lot to swallow in one gulp, so a recap is perhaps in order. UTC, also known as GMT, is the international standard time zone for activities that cross time zone boundaries. In fact, the local time in all other zones is figured relative to the UTC time. Thus, American Eastern Time is UTC minus 5 hours in the winter, and UTC minus 4 hours during periods of Daylight Savings Time. UTC never changes for Daylight Savings Time.

UTC is used in this way to avoid the inevitable confusion that would result from trying to use local times, and converting back and forth on the fly. The simplest way to avoid confusion is to set a clock to UTC based on either the conversion factors set forth in the chart, or by listening to WWV or WWVH and setting it according to the announcements.

And lastly, of particular note for those of you who are detail freaks, the UTC date changes at midnight UTC, and not at midnight local time.

That will do it for this month's column. As always, if you have questions about this or any "Getting Started" topic, please drop me a line at the address above. A reply will be yours if you only remember to include a self-addressed stamped envelope with your question.

mt

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FBI Communications

The Federal Bureau of Investigation (FBI) is perhaps the best known part of the Justice Department. Its sometimes high-profile operations reach into every state in the Union, as well as Guam, Puerto Rico and the Virgin Islands.

Reporting to the Washington, D.C. headquarters of the FBI are fifty-nine field offices. Typically located in large metropolitan areas, the field offices in turn have additional local offices within its district. Table one lists the field office location, district number and call letters (when known). When the call letters are not listed, the number of local offices for the given district are presented. When the call letters are given, the number of local offices, including the field office, can be determined by the number of calls assigned.

For example, the Cleveland District is District 14. The call letters are KEX 740-750. The district has eleven offices, with the field office having the call of KEX 740. In general, the field office will utilize the first call in the list.

Cincinnati is District 13, with the calls of KQC 390-397. The Cincinnati district has eight offices with KQC 390 being the Cincinnati Field Office call letters. The base stations will most often only identify themselves by the numeric portion of the call letters. You would hear Cleveland base then as simply "740" and Cincinnati base as "390." Similarly, all local office base stations are identified. On occasion, the full call may be monitored, usually during radio testing or morning radio checks between the base stations and district headquarters.

The field agents and personnel typically utilize numeric unit numbers, sometimes with an alpha prefix. The alpha prefix is the district field office two letter abbreviation. Using Cleveland once again as an example, the abbreviation is CV. Cincinnati is CI. The unit numbering appears not to be standardized nationwide, however, similarities are noted. The field office will have several blocks of numbers assigned for specific unit functions at the field office location. Then each local office will have a block assigned or portions within a block assigned strictly to the local office.

In addition to the actual field agents, other personnel may be monitored such as radio technicians and vehicle maintenance personnel. An example of a possible district unit numbering configuration is as follows:

1-99	Administration
100-199	Bank Robbery Squad
200-299	Drug Enforcement Unit
300-399	Organized Crime Task Force Unit
400-499	Labor Racketeering Squad
500-599	Gambling Squad
600-699	Local Office A
700-730	Local Office B
731-750	Local Office C
800-825	Radio Technicians/ Vehicle Maintenance Personnel

The numeric portion of the base call letters will not be utilized by field personnel as all identifiers are unique. Radio communications are essential to the daily operation of the FBI nationwide and hence provide monitoring opportunities daily throughout the nation.

The FBI does not have a standard frequency/channel plan like the DEA or U.S. Marshal plan highlighted in the previous edition of Federal File. However, most FBI radio communications are held in several frequency groups. Table two lists the frequency groups that are generally used across the country. Note that typical uses are listed in table two as well as standard frequency increments between channels for a given group.

The search feature of your scanner will enable you to find new or previously unknown frequencies utilized locally. It is recommended that the search increments are no larger than 1 MHz and preferably 500 kHz (0.5 MHz). By keeping the search increments small, the likelihood of discovering new frequencies in use will be greatly enhanced. This process will not yield instant results, however, so be patient!

Nationwide, it appears that two channel designator schemes are in use. In the first method the channels have names of colors as identifiers, such as Blue 2 or Gold 4. The Blue channels are for administrative use and general investigations. The Gold channel series are generally for specialized investigations and surveillances. Other names of colors such as Red and Black have been utilized.

The typical configuration for each is four simplex channels -- Blue 1 through Blue 4, with a fifth simplex channel sometimes being Blue 6. The fifth channel designator, Blue 5 or Gold 5 is a repeater channel or E-C-C (Extended Car-to-Car). The repeater input is channel one of the color series. Sometimes references are monitored simply as Channel 2 or Channel 4. Channel four is a nationwide common frequency of 167.5625 MHz, regardless of channel color designator.

The second channel designator method is associated with the new D.E.S. (Digital Encryption Standard) radio systems being implemented by the FBI. The new radio system has thirty-two channels. The channel designators are alphanumeric and are A-1 through A-8, B-1 through B-8, C-1 through C-8 and D-1 through D-8. Channel usage varies from district to district.

Not all channels are used in some districts. Two or three channels may even be the same frequency with the difference being between simplex or repeater operations. One or two channels are usually utilized for local/state police contact such as an intercity or LEERN channel (Law Enforcement Emergency Radio Network). The actual channel usage may be either shared among various squads and details or have specific assignments such as SHAT.

The next Federal File column will complete the FBI profile and include common code words and terms used by the FBI as well as common Ten Codes utilized. Future planned Federal File topics are UHF Military Operations (225-400 MHz); continuation of Justice Department Profile; GWEN (Ground Wave Emergency Network) system profile and more.

Table One

FBI Field Office Locations

1	Albany	Eastern NY, VT	KEC 254-261
2	Albuquerque	NM	10 Os
3	Alexandria	Northern VA	KFQ 240-244
4	Anchorage	AK	4 Os
5	Atlanta	Northern, Western GA	KIE 300-311
6	Baltimore	MD	KGB 747-753
7	Birmingham	Northern AL	8 Os
8	Boston	MA, NH, ME, RI	KCB 800-814
9	Buffalo	Western NY	KEX 590-595
10	Butte	MT	9 Os
11	Charlotte	NC	KEV 220-239
12	Chicago	Northern IL	KSC 210-217
13	Cincinnati	Southern OH	KQC 390-397
14	Cleveland	Northern OH	KEX 740-750
15	Columbia	SC	KEX 820-830
16	Dallas	Northern TX	12 Os
17	Denver	CO	8 Os
18	Detroit	MI	KEX 760-772
19	El Paso	Western TX	2 Os
20	Honolulu	Hawaii	1 Os
21	Houston	Southeastern TX	6 Os
22	Indianapolis	IN	KEX 780-790
23	Jackson	MS	11 Os
24	Jacksonville	Northern FL	6 Os
25	Kansas City	KS, Western MO	KEX 570-582
26	Knoxville	Eastern TN	7 Os
27	Las Vegas	NV	4 Os
28	Little Rock	AR	KFQ 200-208
29	Los Angeles	LA Basin, E to AZ/NV	KMC 250-275
30	Louisville	KY	KIA 320-332
31	Memphis	Western TN	7 Os
32	Miami	Southern FL	KEV 300-305
33	Milwaukee	WI	KSC 220-228
34	Minneapolis	MN, ND, SD	15 Os
35	Mobile	Southern AL	6 Os
36	Newark	NJ	KEX 620-628
37	New Haven	CT	KEX 600-606
38	New Orleans	LA	8 Os
39	New York City	Southeastern NY	KEC 271-283
40	Norfolk	Norfolk	KEX 340-341
41	Oklahoma City	OK	15 Os
42	Omaha	NE, IA	12 os
43	Philadelphia	Eastern PA	KEX 640-651
44	Phoenix	AZ	9 Os
45	Pittsburgh	Western PA, WV	KEX 660-679
46	Portland	OR	KEX 720-728
47	Richmond	Southern VA	KEX 360-369
48	Sacramento	E CA to District 29	KFP 900-910
49	St. Louis	Eastern MO	8 Os
50	Salt Lake City	UT	4 Os
51	San Antonio	Central TX	KEX 840-847
52	San Diego	Southern CA	KEX 680- ?
53	San Francisco	Northern Coastal CA	KFP 970-990
54	San Juan	Puerto Rico, Virgin Is.	6 Os
55	Savannah	Coastal GA	KEV 380-389
56	Seattle	WA	KOD 220-232
57	Springfield	IL (except Chicago)	KEX 800-812
58	Tampa	Central FL	KEV 320-327

Table Two
Common FI Frequency Groups

162.6375 to 162.7875	Repeater Outputs; 12.5 kHz Increments
163.825 to 163.9875	Repeater Outputs; 12.5 kHz Increments
164.000 to 164.550	Repeater Outputs; 25 kHz Increments
167.2375 to 167.7875	Repeater Inputs; Simplex Operations 12.5 kHz Increments
411.000 to 411.150	UHF Links; HHs; 25 kHz Increments
412.425 to 412.550	UHF Links; Repeater Control 25 kHz Increments
414.000 to 414.600	UHF Links; Repeater Control 25 kHz Increments
417.025 to 417.325	UHF Links; Repeater Control 25 kHz Increments
419.225 to 419.525	UHF Links; Repeater Control 25 kHz Increments

CORRECTION

In our March issue, page 32, the first frequency was transposed. Secret Service channel Able is 32.23 MHz, not 32.32 as printed.

high seas

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Arctic DX

Of Snow and Polar Bears...

During the summer months, the weather warms up enough for ships to get into the northern ports, particularly those on Hudson's Bay. This activity allows monitors a chance to hear some of the coast stations and ships in the Arctic.

Starting in the east, around Hudson's Bay, one will find Killineck, N.W.T. (VAW); Frobisher Bay, N.W.T. (VFF); Coral Harbour, N.W.T. (VFU); Inouodjouac, P.Q. (VAL); Poste-de-la-Baleine, P.Q. (VAV); and Churchill, Man. (VAF). The northernmost station is located at Resolute, N.W.T. (VFR).

All of these stations are equipped to handle messages, and all but Killineck, Inouodjouac, and Poste-de-la-Baleine have facilities for duplex telephone calls. All of the stations have 2182 kHz, and Coral Harbour is equipped with 2514 kHz, while the rest have 2582 kHz. Due to the limited amount of traffic which they handle, Inouodjouac and Poste-de-la-Baleine do not have any other frequencies.

The remaining stations, for longer range communications, do have other frequencies, including some CW channels. For the moment, however, only telephony frequencies will be discussed. All of the stations save those with only 2 MHz frequencies have 4376.0 kHz. Resolute is also equipped with 8793.3 kHz, and Frobisher Bay has four other frequencies-6512.6, 8753.9, 13100.8 and 17335.2 kHz. As can be seen, Frobisher Bay is the major communications station in the eastern Arctic.

For those proficient in code, the telegraphy frequencies will be of interest. Churchill, Coral Harbour, Cambridge Bay, Killineck and Resolute all have 500 kHz as well as one other LF frequency.

VAF Churchill	420
VFU Coral Harbour	416
VFF Frobisher Bay	430
VGW Killineck	484
VFR Resolute	474

In addition, Frobisher Bay also has 4236.5, 6493, 8443 and 12671 kHz.

The port of Churchill uses VHF frequencies of 156.400, 156.550 and 156.600 MHz for port operations.

In the western Arctic, information about the various oil company frequencies is quite hard to come by; however, two frequencies on which bases and/or oil rigs have been heard are 16377 and 13420 kHz USB.

In the Athabasca-McKenzie River area there are five stations which operate on the frequency 5803 kHz USB:

VFF 7	Fort Chipewyan, Alta.
VFF 6	Fort Simpson, N.W.T.
VFH 3	Hay River, N.W.T.
VFH 8	Norman Wells, N.W.T.
VYO 21	Tuktoyaktuk, N.W.T.

Hay River is also equipped with 156.800 and 161.800 MHz. The Canadian Coast Guard operates three other coast stations in the Arctic: VFC Cambridge Bay, VFU 6 Coppermine and VFA Inuvik, N.W.T.. Each of these stations is equipped with 2182 kHz and 4363.6 kHz. Inuvik and Cambridge Bay also have 2598 kHz and 5803 kHz. Inuvik, in addition, has 6335.5 kHz, and the same two VHF frequencies as Hay River. Two telegraphy frequencies are in use at Cambridge Bay: 6351.5 and 12671 kHz.

Alaska offers something to those who are interested in northern DX, and who live on the west coast. Along with communications stations, there are also several naval and coast guard stations. For those in Alaska, 161.900 and 162.000 MHz will offer public correspondence traffic from several stations too numerous to mention here.

On the medium frequencies there are some stations which can be heard in southern areas when conditions are right. All of these stations will have 2182 kHz in addition to their working frequency: WKR Home and WGG 58 Juneau are both using 2499 kHz, WGG 53 Cold Bay and WDL 29 Sitka are both on 2312, WDL 26 Cordova and WGG 56 Ketchikan are both on 2397, and WDL 23 Kodiak uses 2309 kHz USB.

On HF, 8802.6 and 6509.5 are shared by KWL 43 King Salmon, KLW 39 Fort Walter, and KWL 21 Juneau and 4125 is shared by WBH 29 Kodiak, KGB 91 Yakute, KGD 58 Anette, and KGI 95 Cold Bay. Station KXW Anchorage operates on 8291.1 kHz. The U.S. Naval station at Adak (NOX) can be heard on 500 and 450 kHz and Kodiak (NCJ) on 500 and 470 kHz, both in CW as well as on the following frequencies for Kodiak:

4143.6 kHz	6518.8 kHz	8718.9 kHz
4428.7	6521.9	8765.4
6218.6	8294.2	8768.5

In addition to the many coast stations which are in the Arctic, it is also quite possible to hear ships in the Arctic. The Canadian Coast Guard uses a fleet of heavy icebreakers in the Arctic during the navigation season to help commercial ships. The following is a list of the Canadian Coast Guard icebreakers, and other ships which you might hear this summer.

CGCW	CCGS Camsell
CGDX	CCGS Des Groseillers
CGBT	CCGS J.B. Bernier
CGGM	CCGS Labrador
CGBN	CCGS Louis S. St. Laurent
CGBE	CCGS Montcalm
CGMZ	CCGS Norman McLeod Rogers
CGSJ	CCGS Simon Fraser
CGBK	CCGS Sir John A. MacDonald
CGDT	CCGS Sir John Franklin
CGCV	CCGS Tupper
CGCG	CSS Hudson

The last ship, CSS Hudson, is not an icebreaker, but rather a hydrographic research ship which is often working in the Arctic. One frequency which is likely to see a lot of activity is 6292.5 kHz. While this frequency is for CW traffic, one can usually at least identify the callsign of the stations heard.

The following Swedish icebreakers are also ships to listen for in northern waters.

SGDG	Ale
SBPG	Ejord
SCYN	Tor
SHPR	Atle
SBXG	Oden
SDIA	Ymer
SBPT	Frej
SCKD	Thule

Among the Soviet icebreakers which have been heard in the past few years are:

UISZ	NIZ Akademik Sergey Korolev
USGH	NISP Passat
UMAY	Akademik Shirshov
EREV	MISP Ernst Erenkel
EREA	MISP Musson
EWVS	NPS Professor Mesyasev
UUYC	Morzhovets
UUYZ	NIS Menel'
UHQS	Akademik Korolev
UIVZ	NIS Kosmonaut Vladislaw Volkov
UZZV	NISS Kosmonaut Georgiy Dobrovol'skiy
USPC	MPS Akademik Knipovich
UKFI	NIS Kosmonaut Yuruy Gregarin
EWWJ	Arktika
ERET	NIS Georgiy Ushakov

U.S. Coast Guard ships which can likely be heard from Alaska include:

NRPN	USCG Ironwood
NLBH	USCGC Cape Romain
NCDL	USCGC Firebush
NRUC	USCGC Storis
NHKW	USCGC Confidence
NRFY	USCGC Flametree
NCDL	USCGC Sedge

NRFJ	USCGC Northwind
	USCGC Sand Tracker
	USCGC Cape Coral

Among the cruise ships which visit the Arctic are:

GCCG	Cunard Princess
SKMW	Lindblad Explorer
PJSL	Rotterdam
PJSF	Statendam
LFSA	Sagafjord
ELBM9	Tropicale
	Daphne
	Island Princess
	Sun Princess
	Pacific Princess

Other ships which may be heard include:

VG7841	Robert Lemeur
VCBJ	Fred J. Agnich
VCLM	M/V Arctic
VXMM	Arctic Trader
VFBL	A.C. Crosbie
VCQB	Chesley A. Crosbie
VCTF	Sir John Crosbie
VCRJ	Irving Eskimo
VCTG	Irving Ocean
VYWD	Edgar Jourdain
VGLN	Irving Arctic
VCLW	M/V Mesange
PGEF	Neddrill II
CZ3946	Pandora II
VCPV	Polar Prince
VGXZ	Jos. Simarc
VYZJ	Luhger Simard
LAPH	Skauvann
VGZX	Lefrene
HPFC	Texaco Alaska
CXKT	Arctic Skol
VSBE3	Cast Musk Ox
VFDC	United Effort
VRCW	Fort Fraser
SGML	M/S General Babrowski
	Kalvik (These are icebreakers owned by Kigoriak)
	Dome Petroleum

Other ships which may be heard include Arctic Surveyor, Chimc, Bill Croseie, Esso Gjoa, Explorer II, Eastern Shell, Freedom Service, Irving Birch, Irving Cedar, Pacnorse, Pelerin, Pioneer Service, and Charles de Vanier. These are some of the ships which have been to the Arctic in the past few years.

While there is no guarantee that these ships will be in the north this year, many of them make trips regularly each year. Other than the icebreakers, the ships are either involved in the oil industry, supplying northern villages, or else they are picking up grain from Churchill to take to Europe, or are from some of the northern mines, such as that at Nanisivik. From now until November is the Arctic shipping season, so there's no time like the present to try for Arctic DX.

For those interested in reading regularly about Arctic and Antarctic DX, the Canadian International DX Club has an Arctic DX column in its monthly newsletter. My thanks to Bob Curtis, Editor of Arctic DX for providing some of the information used in this article.

Just for Fun ...

THE HAM CONVENTION HOTEL

Ten weary, footsore traveling Hams,
All in a woeful plight,
Sought shelter at the Convention Hotel
One dark and stormy night.

"Nine rooms, no more,"
the keeper said,
"Have I to offer you."
"To each of eight a single bed,
But the ninth must serve for two."

A din arose. The troubled host
Could only scratch his head,
For of those tired Amateurs, no two
Would occupy one bed.

The puzzled host was soon at ease,
He was a clever man --
And so to please his guests devised,
This most ingenious plan.

In room marked "A"
two men were placed,
The third was lodged in "B",
The fourth in "C" was then assigned,
The fifth retired to "D".

IN "E" the sixth was tucked away,
In "F" the seventh Ham,
The eighth and ninth in "G" and "H",
And then to "A" he ran.

Wherein the host, as I have said,
Had laid two Radio men by,
Then taking one, the tenth and last --
He put him safe in "I".

Nine single rooms, a room for each,
Were made to serve to ten!
And this it is that puzzles me,
And many wiser men.

Joe Strolin, KIREC

Ike Kerschner, N3IK

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Summer Fun

All too often when good weather comes we discontinue amateur activities. Here are a few ideas on how to get more pleasure out of your ham radio hobby during the warm summer months.

Camping

One of the all-time summer favorite vacation activities is camping. No matter whether you like to relax in a family campground or rough it in the boonies, it's possible to take a rig along and have some ham radio fun. (Incidentally, be sure to take along a pair of headphones. Not everyone will share your enthusiasm for listening to those funny sounds.)

If your camping is done in a motor home or camper, it may be possible to take along your regular rig and simply plug it into the 110 at the campground or use the battery from the vehicle to power it. The antenna can be anything from a simple wire to elaborate beam (whatever you feel like lugging and putting up). For the most part a good mobile antenna will do a superb job under these conditions.

Should your taste run to more exotic ventures such as back-packing or biking, then a bit more thought will need to be given to the rig. Under these circumstances, a QRP (low power) rig that runs from batteries or solar power may fill the bill. The Heathkit HW-7, 8 or 9 can certainly be taken on a back pack or bike trip but they can be a bit bulky. And they may not be suitable if you expect to take an extended trip.

Should that be the case, then you will want to consider building a rig to take along. The QRP ARCI Twofer can be built into a very tiny package. When coupled with a Twofer receiver, it's possible to fit the whole package in the palm of your hand. These rigs, of course, are CW (Morse code) only. If you want a compact phone rig, you'll need to build your own; stick to a VHF-FM handi-talkie or perhaps spring for the AEA 10 Meter SSB/CW HT.

My favorite power source for these QRP camp rigs is a simple battery holder for 8 C or D size cells. If you have the room, the D size is better because it will run longer – an important point when you consider that you're not likely to find a 110 ac outlet for charging batteries. When I take my ICO2AT, I carry the dry battery pack, and six spare AA cells. This is normally enough for a week or more of two meter FMing.

Outback antennas

Since our rig is going to be running low power, we can get away with some fairly light antennas. If you intend to work mainly 80 and 40 meters, then one of the best antennas you can use is a wire 100 feet long. On 40, this equates to a three quarter wave antenna and will look like about 50 ohms to the rig. To adapt the same antenna to 80, simply take along an extra 30 feet of wire and clip it to one end of the 100 foot wire. The result is a quarter wave Marconi and it will work just great.

I use 22 gauge magnet wire for my antenna but the magnet wire has a tendency to stretch if left up for a long period of time. You may want to use 16 gauge wire and hard draw it. To hard draw wire, simply wrap one end around a handle like a hunk of wood or a hammer and the other end to the nearest tree, car bumper or some other solid object and walk away with it till the wire breaks, it will (almost) always break at the end. Once the wire breaks, it is hard drawn. In this case, you'll have a hard drawn copper antenna of about 22 gauge size that will not stretch.

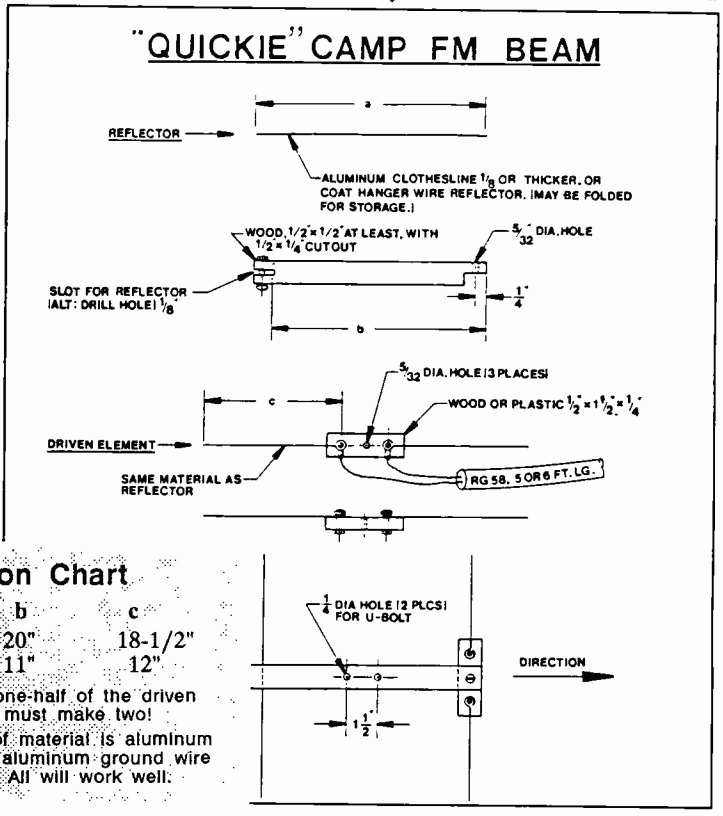
To erect this antenna just tie a rock around one end of a length of cord string and throw it over the top of a handy tree. Now connect one end of the wire to the cord string and pull it up; that's it.

As with any station, a good ground is also very important to the vacationer. Since the station is usually quite close to the earth in a camping situation, it is easy to carry along a hunk of wire to use for a ground. I like to carry a 120 foot 22 gauge wire to use as a counterpoise. Just lay the wire on the ground and connect it to the ground of the rig. If you are lucky enough to have a lake or stream nearby, just chuck the whole thing into the water.

For VHF, the antenna problem is a lot easier. Simply use the whip on the HT, or purchase one of the high gain whips available for VHF use. It is a simple matter to build a portable two or three element yagi or quad for the VHF rig, too.

One neat idea is to use coat hangers to make a two element beam. Cut the reflector to size and fold it in half to fit the pack. A hunk of wood one quarter wave long serves as the boom. The driven element is split and fed directly with coax. Use a block of wood or plastic about one inch long and half inch wide to support the driven element and solder a five foot piece of RG-58 directly to it. The whole thing can be held in place with a machine screw or even tied with cord. To use the antenna, simply unfold the reflector, stick it through the hole in one end and attach the driven element (see figure one).

Your CW station will also require a key (use the smallest you can find or build one from a



Dimension Chart

Band	a	b	c
2 Mtrs.	40"	20"	18-1/2"
1-1/4Mtrs	26-3/8"	11"	12"

Notes: Dimension c is one-half of the driven element, so you must make two!

A good source of material is aluminum clothesline wire, aluminum ground wire or coat hangers. All will work well.

micro switch). A antenna tuner is nice, too, if you can put together a small one that fits the pack. Maybe you'll even want to take along an SWR or power meter!

Rest assured your one or two watts will make plenty of QSO's no matter what band you use. Check into the county hunters nets if your trip takes you to hard to work counties and see how many 599 reports you receive!

Your QSL can be something special too. I like to take a photo of the area the station is set up in and have enough prints made to QSL all the contacts I make from that spot. Use one of the post card QSL kits or buy a rubber stamp to put the name and info on the card.

Maritime Mobile

We won't talk to the folks who own large boats here, but rather the amateur who has a canoe, row boat or other small craft that is not normally equipped with electronics.

For many of us, vacation time is spent on a lake or river trying to catch fish. Did you ever think how nice it would be to chat with a fellow ham when the fish are being uncooperative?

If VHF FM is your thing, you are in like flint. Just chuck the HT in the boat and go. Again, a gain antenna may be of assistance if the area you are fishing is far from a repeater or local ham.

The HF ham can take along the QRP rig he built (Heath HW QRP rigs work great). Power can come from the electric trolling motor battery, a 12 volt dry cell pack or lantern battery (whatever). Of course if the boat has an electrical system, it's easy to install a modern 100 watt (or more) rig. In any case, take care to keep the rig from getting wet.

Antennas on boats are fun, too. One of the cheapest to build is made from a bamboo fishing pole wrapped with thin magnet wire. Try using one half wavelength of wire to start and wrap the pole full of wire. Use coax to feed and connect ground to the boat itself if it is aluminum or put a short piece of wire over board for a ground. (Be careful to stay away from props or moving parts of your boat.) The vertical can be secured using C clamps or a home made bracket.

Hamfests (or Shop till you Drop)

Another summertime activity that I particularly enjoy is hamfesting. Whenever you go on vacation, check the hamfest listings in the various magazines to see if there is a hamfest near the area where you will be vacationing. This is a great way to meet some of the folks you talk to on the air and you can always pick up a great deal on that special do-dad you always wanted. Of course its a good idea to drop the YF and kids off at the local amusement park while you attend the fest (unless they are hams too).

The Bash at Dayton

Speaking of Hamfests, this year's Dayton Hamvention was a real bash. Yours truly picked up a couple of neat items that you will be reading about in the future. This hamfest is a real ham vacation all by itself. Attend Dayton and gorge yourself on ham radio for three full days. There are so many activities to choose from it is impossible to get bored and the goodies will keep you drooling for the rest of the year. Spending time in the flea market is to get a true view of what this amateur radio hobby is all about. If you can't find it at Dayton, most likely you won't find it anywhere.

Special Event Station

The Cuyahoga Amateur Radio Society (CARS) will operate stations: K8FZR, N8HHG and WB8N for 48 hours August 6 and 7 from the Twins Days Festival --- the largest annual gathering of twins in the world. Suggested frequencies: Phone 7.230, 14,245, 28,450 (+/- 10kHz.) and 146.11/82 repeater, CW on the lower general portion of 20, 40 and 80 meter bands. For special photo QSL's from each station worked and an additional certificate for working all three stations, send a completed QSL for each station worked (SWL letters welcomed) and one self-addressed, stamped envelope to: Paul Buescher, 1752 Stone Creek Lane, Twinsburg, Ohio 44087.

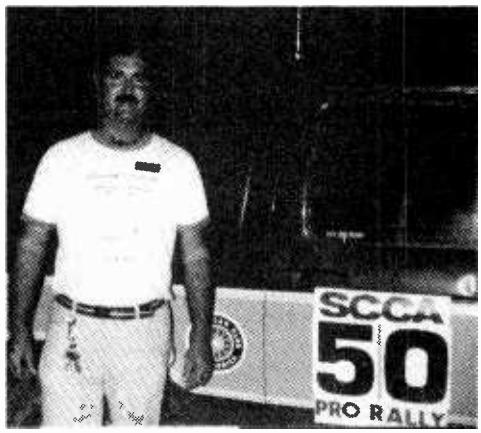
Novice Newsletter

A few issues back I mentioned the ICOM *Novice World* newsletter. I have been receiving this letter and like it a lot. The newsletter is free, all you need do is write ICOM America, Novice World, 2380 - 116th Ave. N.E. Bellevue, Washington 98004 and ask to be put on the mailing list. This newsletter contains lots of ideas on setting up and operating a station. ICOM is doing a great job with this journal. Try it; you'll like it!

Propagation

I recently received a very interesting book entitled *The QRPer's BASIC Propagation Tool Kit* by Bob Brown NM7M. It is aimed at anyone with an interest in radio propagation and computer programming in BASIC.

The book contains information about the fundamental features of propagation: signal strengths and MUF's (maximum useable frequencies). There are several short programs and 8 modules.



David Montgomery, KA5SKU, was part of the 2 meter communications system at the SCCA Pro Ralley at Ouachita National Forest west of Little Rock, Arkansas.

The programs illustrate things like skip distance, antenna patterns and how propagation varies with solar flux and magnetic activity. The modules can be used separately or together with the prediction programs.

Each of the modules is less than 30 lines of BASIC which makes them them simple to enter, de-bug and explore. After going through the modules, directions are given as to how they can be combined and edited to build two propagation programs.

This approach is quite unique in that it allows the user to acquire actual knowledge of how propagation works and what factors influence skip distance at a given time. Without doubt, anyone interested in propagation would gain a great deal from this easy-to-read manual.

The book is available from the QRP Candy Store for $6.50 postpaid in the U.S.A. or $8.00 overseas. Send check or Money order to Bob Spidell, W6SKQ, 45020 N. Camolin Ave., Lancaster, CA 93534.

More QRP news

Richard Arland, K7HYA, is looking for stories and information about QRPing to be presented on his twice monthly radio segment on HCJB (Voice of the Andes). If you wish to send material to Richard, it should be on either cassette tape or 7 inch open reel at a 7.5 IPS recording speed. Before you start recording, send Rich a letter outlining what you wish to talk about (QRP related only). Richard's address is 9 Vine Street, Shavertown, PA 18708. Here is your chance to be a radio star!

mt

Ken Reitz

Route 5, Box 156A
Louisa, VA 23093

DXing NASA and the Space Shuttle

America's reentry into space, beginning with the late-August launch of the space shuttle, will provide interesting video opportunities for the home dish owner. Many of you will remember the early days of the space shuttle program when American network coverage was virtually lift-off to landing.

As missions became more commonplace, the networks decreased their coverage to a point where only a few minutes before and after lift-off and landing were covered. The networks believed, perhaps rightly, that routine space missions could no longer compete with the excitement of daytime TV dramas.

Some of us found this to be a most unsatisfactory policy and we searched the frequency spectrum for a remedy. In the eastern United States, the amateur radio club at the Goddard Space Flight Center in Greenbelt, Maryland, "rebroadcast" entire missions on the ham bands. Unfortunately, it is rife with all of the things that shortwave listeners dread: static crashes, whistles, whines and hams tuning up on the frequency.

Still, to hear the hour by hour operations in space, live, is some of the most dramatic radio one will ever hear. Not only is it live but it is uninterrupted by blow-dried media stars and commercials for bathroom products and dogfood.

NASA Select

The best way to follow a space mission is on satellite TV -- and it's a well-kept secret. Owners of TVRO (Television Receive-Only Earth Station) systems can tap into something called NASA Select. The channel, operated by the National Aeronautical and Space Administration, provides not only lift-off to landing coverage but "change of shift" briefings (Remember: these missions are 24 hours/day and there has to be a mission controller the whole time). In addition, routine or special event briefings, as in the case of an attempted repair of a previously launched communications satellite, are also presented.

It should be noted that on occasion NASA will feed or downlink video or data during a mission which is of a military or national security nature. You may be assured that these portions of the feeds are scrambled and they're not using the Videocypher II!

NASA Select can be found on Satcom F2 Transponder 13. But keep your eye on it even when there is no current mission. It was active, for example, during recent test firings of the newly designed booster rockets. You will also find it active in other space related activities. When Voyager II was sending back live video of Uranus in January 1986 it was on NASA Select complete with appropriate scientific experts who gave detailed and knowledgeable commentary. It was fascinating.

For those of you who would like to look ahead, next year the intrepid Voyager meets Neptune and it will be spectacular.

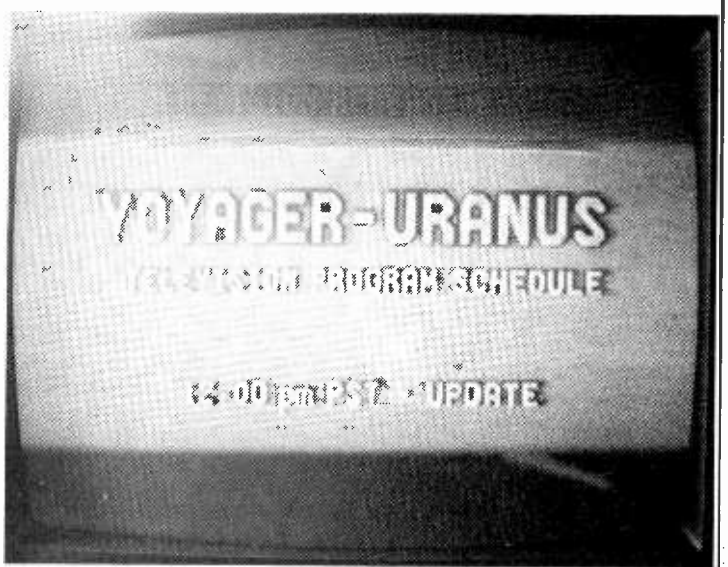
With renewed American space activity there is likely to be world-wide interest. Look for coverage on the usual American network feeds but pay attention to foreign feeds as well. The accompanying chart will help in space launch coverage.

Back to Basics

Don't know a Polarotor from a Rotorooter? Back to Basics is here to help. Each month in this part of the column, we'll go into the basics of TVRO. This month I have some tips on installing your TVRO system.

There are two ways to install a system: the dealer-delivered method and the do-it-yourself method. Of the two the former is the easiest and the latter the more interesting. Having a dealer install the system for you costs considerably more and keeps you isolated from the inner working of the system. This makes you less knowledgeable about TVRO and more dependent on your dealer.

Of course, many of us have no choice in the matter since there may not be a dealer within a reasonable distance from our location. To find out if you have a local dealer check your Yellow Pages under Satellite Equipment and Systems; call or write the SBCA at the address or phone number at the end of this column; or call about KSAT's "Quality Dealer" program, also listed.



NASA-Select billboard during the Voyager's Uranus pass-by in 1986; next year, Neptune! Stay tuned!

Space Shuttle Coverage

Satellite	Transponder	Service
F2	13	NASA Select
F2	22	AFRTS (Check their audio sub-carriers as well)
G2	11	NHK (Japan) WTN (To Tokyo)
T2 and T1	Various	Look here for ABC, CBS, NASA network backhauls.
W4	10	WTN/CNN/Brightstar
W4	14	BCNZ/WTN/Brightstar
W4	16	CNN Contract
A1 and A2	Various	Look for Canadian Backhauls
W5	7	CBS Contract

(Notes: NBC will rarely be seen on any of the C Band satellites. While it does maintain a regular feed on F1 transponder 8, all of its backhaul and contract channels will be on Ku Band satellites. Also, look for occasional wild feeds. I recently noted color bars and a billboard for NASA, Langley, on G2 transponder 5.)

If you do have a local dealer and you still decide to install it yourself it's a good idea to establish a good rapport with him. A good dealer will not resent the do-it-yourselfer because eventually you'll need advice, assistance or a good source of fast parts. In addition, if you have any technical ability you may find yourself with a part-time job doing installations or servicing gear. At any rate, most dealers appreciate people who have a technical interest in satellite television and are happy to "talk shop" with those who enjoy the industry as much as they do.

However, one thing all dealers resent is the person who bought a mailorder junker system, made a hash out of the installation and now expects the dealer to make it work properly.

Legal Obstacles

Before you buy a TVRO system there are some critical things you must do.

First, you'll need to make inquiries with your local government to find out if there are any restrictions on installing a dish on your property. Some localities (often with more than a little help from cable TV interests) have enacted zoning restrictions against dish installations. There may also be neighborhood covenants against dishes (better read your deed). A construction permit or other fees may be required by some localities.

It is possible that such laws are unconstitutional or at least illegal. Only one ban against dishes has been upheld by a lower Federal court and that judgment is being appealed. Often localities drop such restrictions when challenged. Expect the most controversy in urban and suburban areas (particularly where there is a strong cable monopoly). If you ignore local restrictions you may eventually be asked to remove or relocate your dish to suit local authorities. You may try to fight it out in court or you may just give up and sign on with your local cable company (which is what everyone hopes you will do).

It should be noted that these zoning restrictions are written so broadly as to enable authorities to remove any "offensive" communications structure. This could apply to Ham, CB or SWL antennae, indeed, it could even apply to your external UHF-VHF TV antenna!

Next Month

Assuming you can satisfy all the local busybodies, cable snoopers and petty bureaucrats, you'll be ready to do a "Site Survey."

Information, Please!

There are many sources for information on satellite television. Any list you may see here should be considered incomplete. The following are of particular interest:

Don't know a Polarotor from a Rotorooter? Help is available! Some of these suggested sources and our Back to Basics section will get you started.

Super Television--(Spring, 1988) Featuring the 1988 Satellite TV buyer's guide. This quarterly magazine is worth many times its $8.00 a year subscription price. Sure, there's plenty of guff about 3-D Camcorders and "Dream Home Entertainment Centers" (My dream is to have someone else foot the bill). But the forty-five pages in the spring issue is excellent with plenty of photos and a straightforward text. Write them for the back issue. Offer to buy a year's subscription and tell them to start with the Spring 1988 issue. *Super Television* is published by Miller Magazines, Inc., 2660 E. Main Street, Ventura, CA 93003. Or call them at 805-643-3664. One year (four issues) $8.00.

Satellite Television and You--From the publisher of a major TVRO weekly guide. This is the booklet I would like to write. It's a 30-plus page, magazine-size, booklet which tells you everything about TVRO but the prices. It's at your STV dealer's showroom and best of all it's free. No dealer? Write the publisher or call and tell them you read about it in *Monitoring Times*. They'll send it right out to you. *Satellite TV and* You is published by Triple D Publications at P.O. Box 2347, Shelby, NC 28151-2347 or call 704-482-9673.

Orbit--A monthly guide to TVRO channels recently devoted part of an issue to a buyer's guide. Though the issue is no longer on the bookstore shelves it may still be available from the publisher. Call Satellite Orbit, CommTek Publishing at 208-322-2800.

Satman--A mail-order dealer of high quality components offers their *Satellite TVBuying Guide*. While limited in size, it offers a useful introduction to TVRO. It also includes a price list and order form for the products they carry. Write: Satellite TV Buying Guide, Satman, 5017 N. Melody, Peoria, IL 61614 or use their toll-free number: 800-4-SATMAN.

And finally, the two organizations mentioned earlier. The SBCA is the Satellite Broadcasting and Communications Association located at 300 N. Washington Street, Suite 208, Alexandria, VA 22304. Call them at 703-549-6990. They are a TVRO lobbying group which sponsors an information program on F2 transponder 4 6.20 audio subcarrier. The program, heard on North America One Monday through Friday from 10 p.m. 'till 1 a.m. (ET), is repeated the following weekday from 1 p.m. - 4 p.m. (ET). They may be reached at 608-647-6387.

K-SAT is a listener-supported TVRO information channel operating on the 6.2 audio subcarrier of Spacenet 1 transponder 3 and Spacenet 2 transponder 9. They run a variety of TVRO related programs 24 hours a day including live call-in shows from 7-12 p.m. (ET) weeknights with taped repeats the following afternoons. Call them about the "Quality Dealer Program" at 408-848-4470.

Paul Swearingen

3132 SE Irvingham
Topeka, KS 66605

The Death of the Moviehouse

If you had the choice of going to your local movie house or staying home and watching a feature film, which would you choose? You could go through the hassle of driving, finding a parking spot, buying a ticket and then enduring sticky seats and screaming pre-teens (not to mention blasts of arctic air conditioning and an overworked speaker system) once you arrived.

Despite that rather unappealing scenario, many people do opt for the movie house for one main reason: the superior image made possible by film. If you stay at home, you're stuck with a wavery, grainy image on your TV, even if you are lucky enough to own a Super-VHS or Super-Beta VCR.

High-definition television systems have been around for some time now, but you're not likely to have seen them, as they are used almost exclusively in closed-circuit studio systems. The problem is that none of the currently used television broadcast systems -- NTSC, SECAM, or PAL -- will reproduce the 1,050 to 1,125 lines necessary for High Definition television (HDTV). The U.S. (and Japanese) NTSC system was set by the FCC at 525 lines in 1953, after a battle between competing systems similar to that between Kahn and Motorola's AM stereo systems today. Most VCR's actually give you between 300 and 400 lines of definition. And until now, the current NTSC system has been incompatible with any tested HDTV system.

Enter now the Advanced Compatible Television (ACT) system created by the David Sarnoff Research Center in Princeton, New Jersey. It would be compatible with current color and black-and-white sets and can be broadcast with 1,050 lines. Moreover, the signal would take up no more spectrum than current TV signals.

The ACT system would allow you to receive HDTV programs on your current set, although they would not appear much different than current NTSC broadcasts, and you could purchase an HDTV set when you were good and ready. Most people didn't throw out their monophonic sound TV sets when they bought a stereo TV, and neither would you junk your current TVs to buy HDTV sets (which probably cost several thousand dollars).

Some TV shows and movies are currently being taped in an HDTV system developed in Japan, and of course filmed shows could easily be converted to HDTV videotape or videodisc. But until the FCC decides on one of at least six current competing systems, home viewers won't be able to run out and purchase a VCR or TV utilizing HDTV technology.

What will happen to movies houses when HDTV becomes available? Look for drive-in movies to convert en masse to flea markets. But let's hope that the FCC forgets about letting the "marketplace" influence its decision, which could feasibly be as soon as the early 1990s, or the public will be the loser -- as it has been in the AM stereo fiasco prolonged by the FCC.

Desert Test of 5,000 Foot Longwire Antenna

Brian R. Webb, of Van Nuys, California, writes in with the results of his tests with a 5,000-foot longwire antenna set up west of Lancaster, California, in the Mojave desert. He used 24-gauge plastic insulated wire and laid it on the ground at a heading of 115/295 degrees from true north, coupling it at the east end to the receiver through what he calls a "gimmick capacitor." On AM (medium wave), he reports excellent gain and a lack of signal fading, which would be expected on an antenna of this length.

Others have had good luck in the desert with even an uninsulated antenna (electric fence wire) laid across the sand at a distance of about 2,500 feet or so.) However, purists would demand that the antenna be of heavier wire and as far away from the ground as possible, and if the characteristics of a true beverage antenna were desired, the far end of the antenna have to be terminated through a 500-1,000 ohm resistor, either fixed-value or a potentiometer (as with a volume control). Practical considerations often outweigh theoretical, however.

Lots of Wire; Lots of Work

On a weekend outing, it's no fun to erect 15-foot poles and take them down, and winding up and unkinking 3,000 feet of 16-gauge wire is not for the faint of heart. In the desert, it's nigh unto impossible to ground anything through a foot or so of sand covering lava deposits. So, stretch it out as long as you can, however you can. But stay away from electrical wires (to avoid getting fried and to avoid frying sounds on your receiver) and watch out for sudden thunderstorms (the static electricity alone can render your receiver into so much electronic junk). And enjoy the fresh air, sunshine, and stars at night while you're on

your beverage party. Let me know how you do.

Revise Those AM DX Patterns

Roger Winsor of Hobart, Indiana, reported an AM opening to Massachusetts recently. While tuning around before local sunrise, he stumbled on WKOX-1200 Framingham and had the presence of mind to tune down to 640 where he heard WNNZ-640 Westfield on top at 0510.

Although I've preferred sunset DX for years, I'm going to have to rework my sleep habits and get up earlier to DX; I recently heard a new pair of Arkansas stations at 0600-0610 CDT, probably just after both had upped their power to maximum daytime levels. I have a feeling that the myriad of low-powered all-nighters the FCC has allowed will drive many DXers to revise their DX methods.

Early morning hours are probably the most under-used and yet most productive times available to DXers for several reasons. A darkness path to TP (Trans-Pacific) stations, less active weather patterns producing less static and more stable signal paths, the fewest number of stations on the air, and, for those living west of the Eastern time zone, a near-darkness path to east coast stations, as they do raise their powers to the higher day levels. You don't believe me? Pop your lazy bones out of bed some morning an hour before sunrise and try it!

DXing Earthquakes with an AM Radio

Can you DX earthquakes on the broadcast band? Ray Cole, who lives on top of the New Madrid Fault in southeast Missouri, site of one of the most devastating earthquakes in recorded history, doesn't say so in exactly those terms, but he has made detailed observations which show that radio station frequencies in his area have deviated by as much as 15 kHz on several stable receivers . . . and then snapped back on frequency at approximately the same time earthquakes in other parts of the world were taking place.

The cause of this phenomenon is not definitely known yet, but Ray has been able to rule out quite a few possibilities, including air and ground moisture, electrical ground currents, moon and tide cycles, magnetism, and receiver defects. One theory from a radio engineer is that quartz, which vibrates under pressure, produces radio waves which then mix with man-made signals and cause the deviations. Different stresses on the different layers of quartz, which is abundant in southeast Missouri, can cause different deviations. And a chance meeting with a local station owner provided the information that an FCC mobile crew in town had informed the station manager that his station was "way off frequency," but that a later follow-up reported that all was well.

Ray's accurate and detailed observations have attracted attention from respected scientists around the world who are studying his data. Ray would also like to see DXers who live close to fault zones actively monitoring similar conditions in their areas and sharing information with earthquake experts. He feels that if the frequency deviations are indeed caused by pressures building up before tremors that an earthquake warning system could be established for citizen protection. If you're interested, send your name, address, and a description of your expertise and equipment to me and I'll forward your letter to Ray.

Station Changes

Let's catch up on recent station changes. First, Jerry Starr has gathered these AM changes: CFBK-630 Huntsville, ON, is silent, having followed the trend of some Canadian stations of moving their programming to FM; South Carolina may become an easier DX target with a daytimer from Columbia receiving a grant for 840 kHz with 50 KW, daytime directional; KKGZ-1010 Brush, CO, is back on with a C&W format; WSGI-1190 Springfield, TN, will move to 1100 kHz with its 1 KW, daytime non-directional antenna; WTCN-1220 Stillwater, MN, will go to 1210 with 10 KW day/790 night, non-directional; KSEK-1340 Pittsburg, KS, is back on the air; WMNE-1360 Menomonie, WI, will move to 870 kHz with 10/.6 KW, non-directional; KWYD-1580 Colorado Springs, CO, is back on.

TV news, thanks to WTFDA's Bill Fahber: CPs have been granted on the following channels: 3-Douglas, AZ, and Lakin, KS; 8-Key West FL; 20-Billings, MT; 21-Brunswick, GA; 22-Key West, FL, and Waterloo, IA; 25-Tequesta, FL; 29-Eureka, CA; 34-Waco, TX; 36-Paris, TX, and Sioux Falls, SD; 40-Bluefield, WV; 45-Shreveport, LA; 47-Rocky Mount, NC; 55-Poplar Bluff, Mo, and Rock Hill, SC; 63-Newton, NJ; 69-Hollywood, FL, and Indianapolis, IN. Don't be surprised if many of these turn out to be shopping network outlets.

Don't forget. Your deadline to submit plans in my best nonamplified loop antenna contest is July 10. Get those brainwaves cooking! Until next time, 73.

mt

Dr. John Santosuosso

P.O. Box 1116
Highland City, FL 33846

The Well-Bred Pirate

From time to time I am fortunate enough to have the opportunity to talk with my good friend, R. F. Burns, of Radio Clandestine. Now, as some readers will know, Radio Clandestine is a venerable old pirate which has managed to survive for over ten years. Very few unlicensed stations can make a claim like that. Some bite the dust after a few weeks or even a single broadcast. But if you converse with Burns, you get a rare insight into what makes a successful pirate -- and what must be avoided if the station is not to fail.

One of the keys to the success of stations like Radio Clandestine is that they always stress quality programming. To be sure, they've done things that conventional radio would not dare do, but there was a lot more to it than that. Scripts were carefully prepared, and programs professionally produced. If you ever heard Radio Confusion's Rev. Dean Bean, J. Edgar Heaver on The Voice of Laryngitis or that zany crew of the Clandestine pirate ship, you would make every possible effort to hear them again. Stations like these built up a loyal audience which would go to the trouble to seek them out.

Laying Low

Because it feared it might compromise security, Radio Clandestine for some years had no way to communicate with its audience. Through the work of Burns that changed. The station did nothing foolish, though. It didn't use a local post office box or give out personal telephone numbers during broadcasts. (Believe it or not, a lot of pirates have and the result has been some very short broadcasting careers.)

Burns and Clandestine have always worked through a reliable mail drop which could be counted on to forward letters to and from the station. Those really serious about contacting the pirate ship never minded enclosing three mint stamps to handle the expense of the forwarding their letter to and from the station.

While the Clandestine crew cannot always reply as rapidly as it would like (pirating is necessarily a part-time vocation), it has been faithful about answering its mail and thus building further listener loyalty.

Asking a Lot from Listeners

Such listener dedication pays off when you consider some of the other factors for successful pirating. First of all, while it does make it tougher to hear it, the pirate ship has never sailed on a regular schedule. While normally favoring weekend and holiday transmissions, actual broadcast times and frequencies are never announced in advance and are often changed. The loyal pirate enthusiast does not care. He will be searching, and he will be grateful that his favorite stations will be around long enough to enjoy.

Again, when opposite conditions are the case, disaster is often the result. A few years ago a delightful pirate using the call RX4M, The Voice of Cliperton, operated from the Seattle, Washington, area. Its signal made it clear across the United States and for a brief period, it was heard almost nightly.

Among other things, the gang at Cliperton featured recorded old time radio shows. They were fun to hear -- either for the first time or as a trip down memory lane. Unfortunately it was those nightly broadcasts that got the station into trouble. Before long the FCC was listening also.

Two other rules, if observed, will also help to promote the health of a pirate. Stations such as Clandestine are very careful to pick frequencies where they will not interfere with other broadcasters. To do otherwise would be to attract unwanted attention and probable complaints to the FCC. It also would make it difficult or impossible for potential listeners to hear the broadcast.

Quality pirates may engage in satire but they avoid personal attacks. Such spleen venting is not part of a class act, and again is likely to draw the attention of the FCC. The better stations simply do not do it.

If you come across a pirate that operates according to the above pattern, chances are that you'll enjoy listening. Chances are, too, that like Radio Clandestine, it will be around for a while.

Where to Tune

As we reported last month, chances appear good that, as the year progresses and as we get into next year, pirate activity should increase. As sunspots multiply, so do the pirates! For the time being, however, pirate broadcasts may still be somewhat on the sparse side. Still, if you know where to look you have a chance of being rewarded.

If you are in or near a major metropolitan area, check just above the medium wave (AM) band around 1620 kilohertz. It might not hurt to try the low and high ends of the FM band either and even TV channel 4. VCRs can and have been converted into very low power pirate transmitters.

On the shortwaves, there continues to be at least a little activity in that traditional pirate band which runs between about 7370 and 7500 kilohertz. If there is anyplace where activity has already shown signs of growth, it may be between 3400 and 3500 kilohertz. Some pirates appear to be relocating to these frequencies because their old haunts have become crowded with government broadcast or utility stations.

By all means let us know what you hear. If you are fortunate enough to QSL the station, we would love to have a copy of the verification. If possible, we will use it in this column, but please don't risk the loss of the originals by sending them through the mail.

Keeping in Touch

And remember, station operators, we would like to hear from you. Let us know about your programming, frequency bands you might use, and the kind of audience you would most like to reach. Keep us up-to-date about your station and its staff, and we

will try our best to keep *Monitoring Times* readers fully informed.

One station that has always done a super job of staying in touch is Tangerine Radio. We recently received some material on political anarchism (the peaceful kind!) from station operator Raunchy Rick. If you hear a Tangerine transmission you'll know it almost immediately. Unlike most pirates, many Tangerine broadcasts are politically oriented and do promote the operator's philosophy. You may disagree with Rick, and disagree strongly, but he will force you to think about your own values and why you hold them.

We do not have any present schedule for Tangerine Radio. But weekends and the night of the full moon might just bring this unusual station to you. If you log it let us know.

Those K and U Beacons

From Wisconsin, John Tuchscherer wrote to bring to our attention an excellent article by Bill Orr. According to Orr, those K and U CW beacons which have been discussed in recent columns may very well be related to Soviet naval, especially submarine, activity. He suggests that at least some are probably located near Murmansk and the Siberian Kanchatka Peninsula.

John reports he hears one of the U beacons nightly on 4450 kilohertz. Contributions such as his are deeply appreciated. Send us your numbers, clandestine, and pirate news. Other *Monitoring Times* readers will appreciate your thoughtfulness.

If you ever heard Radio Confusion's Rev. Dean Bean, J. Edgar Heaver on The Voice of Laryngitis or that zany crew of the Clandestine pirate ship, you would make every possible effort to hear them again.

RADIO CLANDESTINE

Behind the Microphone at

CSM World Service

It's a crystal clear early morning in Boston. In a conference room on the third floor of the Christian Science Broadcasting Center, the rapid-fire discussion is of people, places and things happening far away from the sunny morning outside. The five-person editorial and production staff of News Focus is in the middle of its daily morning story conference, choosing the stories it will air in a few hours to tens of thousands of shortwave listeners throughout the world.

". . . We're waiting for a phone feed (transmission) from our El Salvador correspondent . . . right now, that's our lead story for today . . ."

". . . There was another Iraqi air attack in the Gulf, but I don't think we can offer any new context at this time . . . "

". . . But people are curious about Khomeini and what he might do . . ."

Ten minutes after the meeting began, the room is empty. Having decided on five or six stories, the News Focus staff has scattered to telephones, word processing terminals, and recording booths, to do the interviewing, writing, taping, editing and rehearsing that will make the stories come alive for World Service listeners in a few hours.

News Focus is a 25-minute daily weekday program (repeated with other World Service programming on a different shortwave frequency every two hours) whose purpose is to probe beneath the surface of the international stories of the day.

"We do a lot of debating and testing among ourselves to make sure we are providing our listeners with journalism that meets the *Monitor*'s standards of accuracy and objectivity," says News Focus producer Karla Vallance.

On the fifth floor of the Broadcasting Center are the sophisticated studios and recording equipment that help the 12-member World Service on-air and production staff assemble programming with technical quality that matches its editorial professionalism.

In an editing booth, World Service feature's producer Dawn Van Dyck is listening to a tape of the music and words of Nigerian master drummer Olatunji and the narration of a World Service music reporter.

Van Dyck turns to the reporter, "I like your overall creative approach to the piece, but the music is too hot (loud) under your narration in places. On shortwave (because of the variable transmission reception quality), it's going to come out muddled. Let's redo your narration to make it sound cleaner."

The music piece will be heard in a few days on Monitor Forum, a regular World Service feature that provides listeners with thoughtful human interest stories and is one of two key programs produced by Van Dyck. The other is Kaleidoscope, another regular feature offering fresh insight into social, political or religious issues from cultures and countries around the world. Together, the two programs fill 27 minutes of World Service's two-hour program lineup.

Van Dyck is on the phone with a Mideast correspondent about an upcoming Kaleidoscope story on the effects of the seven-year Iran-Iraq war on the Persian Gulf marine environment and the people who depend upon the sea for their livelihood. She listens to the reporter's story in progress and offers suggestions on how to make the story most meaningful for World Service listeners.

When looking for story ideas, Van Dyck, News Focus producer Vallance and all the other World Service producers depend not only on the highly professional Boston staff, but also on the expert *Monitor* correspondents and other journalists around the globe. Finishing her call with the Mideast contact, Van Dyck tells an observer, "We probably have 50 stories in various stages of development at any one time."

Meanwhile at News Focus, it's getting closer to air time. News Focus is the World Service program that devotes the most "live on-air" minutes to its production, so everyday there's an increasing amount of excitement and controlled anxiety as air time approaches.

Producer Vallance is juggling the story lineup. The lead story from El Salvador has been cancelled because the day's events offered no new angle for News Focus to explore. (World Service headlines on the hour and half hour assure that listeners will get any key developments on this and other international stories.)

Discussing the dilemma with colleagues, Vallance wipes the title of the El Salvador piece off a blackboard and revises the sequence of other stories. A story on strife among the Tamil people of Sri Lanka becomes the lead. An interview with an Afghan war correspondent will now be able to run a little longer than expected.

Staff members are now busy at computer terminals, entering information -- the new story sequence, the script for the News Focus host, time length allotted to each piece -- that will become the map for the staff to follow to guide them through the show.

In the broadcast studio, World Service director Paulette Kerniss is working with the program engineers on some last-minute rehearsals of the integration of live voices and prerecorded sound that will occur in a few minutes as part of the broadcast.

With a friendly but professional style, Kerniss is the person who will direct the World Service on-air performance for the next two hours, like the conductor of a small orchestra.

It is now just minutes before broadcast. Kerniss calls politely for "quiet time." The casual control room banter ceases. The distinctive World Service theme music flows from the studio speakers, but all else is quiet as Kerniss, the engineers, producers, announcers, and assistants close their eyes in a moment of prayerful thought.

A minute later, as the music intensifies, Kerniss looks at an announcer who watches her from a room separated from the main production area by soundproof glass. Kerniss holds up a hand, giving the "stop" signal. She glances at the clock. "Ten seconds, wait for my cue," she tells the announcer through an intercom. As the second hand sweeps past the top of the clock, Kerniss' fluid pointing gesture to the announcer indicates silently and calmly, "OK, go. Let's begin."

In Boston, the announcer begins to speak. And from thousands upon thousands of shortwave radios throughout the world come the words, "You're listening to the World Service of the Christian Science Monitor . . ."

By Kim Shippey
Executive Producer, CSM World Service

Day to Day Shortwave

How to Use This Section

Day to Day Shortwave is your daily guide to the programs being broadcast on the international bands. Wherever possible, actual advance program details for the listed stations are included. To use this section, simply look up the day on which you are listening, check the time, and decide which program interests you. Then go to the frequency section in order to locate the frequency of the station/program on the dial.

All days are in *UTC*. Keep in mind that the new UTC day begins at 0000 UTC. Therefore, if you are listening to the shortwave at 7:01 PM [EST] on your local Thursday night, that's equal to 0001 UTC and therefore *Friday* UTC.

We invite readers to submit information and reviews about their favorite programs. These must be in UTC day and time and can be sent to program manager Kannon Shanmugan.

We also invite broadcast stations to submit advance program details for publication in *Monitoring Times*. Copy deadline is the 1st of the month preceding publication [i.e. details for programs to be broadcast in September must be received at *Monitoring Times* by August 1st.] Information can be FAXed via 1-704-837-6416 and must include the following information at the top of the first page: To: Monitoring Times, Brasstown, North Carolina. Phone: 1-704-837-9200.

Program Manager
Kannon Shanmugan
4227 Wimbledon Drive
Lawrence, KS 66046

Sunday

0000 British Broadcasting Corporation: World News
0000 Radio Canada International: News
0008 RCI: SWL Digest--Experienced listeners may find this a bit basic; Glenn Hauser's DX news a plus
0009 BBC: News About Britain
0015 BBC: Radio Newsreel
0030 BBC: Music Series
0030 RCI: Canada Rocks
0038 RCI: Spotlight on Science
0100 BBC: News Summary
0100 RCI: News
0100 Radiotelevisione Italiana: News
0100 Radio Japan: News
0101 BBC: Play of the Week
0108 RCI: Innovation Canada
0115 RAI: Tunes for Whistling
0115 Radio Japan: One in a Hundred Million
0200 BBC: World News
0209 BBC: British Press Review
0230 BBC: The Ken Bruce Show (music mix and entertainment news)
0230 Radio Netherlands: World News
0235 Radio Netherlands: Newsline
0250 Radio Netherlands: Over To You! (letters)
0300 BBC: World News
0309 BBC: News About Britain
0315 BBC: From Our Own Correspondent
0330 BBC: A Word in Edgeways (discussion)
0400 BBC: Newsdesk
0430 BBC: Classical Music
0445 BBC: Reflections (religion)
0450 BBC: Financial Review
0500 BBC: World News
0509 BBC: Twenty-four Hours (news magazine)
0530 BBC: Radio Netherlands: World News
0530 BBC: The A-Z of Hollywood
0535 Radio Netherlands: Newsline
0550 Radio Netherlands: Over To You! (letters)
0600 BBC: Newsdesk
0630 BBC: Jazz Program
0700 BBC: World News
0709 BBC: Twenty-four Hours (news magazine)
0730 BBC: From Our Own Correspondent
0745 BBC: Words
0750 BBC: Waveguide--Geared toward neophyte listeners, this program is rather useless save for BBC frequency information.
0800 BBC: World News
0809 BBC: Reflections (religion)
0815 BBC: The Pleasure's Yours (classical music requests)
0900 BBC: World News
0909 BBC: British Press Review
0915 BBC: Science in Action
0945 BBC: Talks
1000 BBC: News Summary
1001 BBC: Short Story
1015 BBC: Classical Record Review
1030 BBC: Religious Service
1100 BBC: World News
1109 BBC: News About Britain
1115 BBC: From Our Own Correspondent
1130 BBC: Music Series
1200 BBC: News Summary
1200 RCI: News
1201 BBC: Play of the Week
1208 RCI: Innovation Canada
1300 BBC: World News
1304 RCI: Sunday Morning
1309 BBC: Twenty-four Hours (news magazine)
1330 BBC: Sports Roundup
1345 BBC: The Tony Myatt Request Show
1400 BBC: News Summary
1401 BBC: The Tony Myatt Request Show, continued
1430 BBC: A Word in Edgeways (discussion)
1500 BBC: Radio Newsreel
1515 BBC: Concert Hall
1600 BBC: World News
1609 BBC: News About Britain
1615 BBC: Feature
1645 BBC: Letter From America
1700 BBC: World News
1709 BBC: Commentary
1715 BBC: Jazz Program
1745 BBC: Sports Roundup
1800 RCI: News
1800 WRNO: World Radio-- This shortwave program, hosted by MT's own Glenn Hauser, concentrates on features. Highly recommended.
1808 RCI: Listeners'Corner-- Comparatively, a nice mix of letters and music requests; announcers have enjoyable rapport.
1830 BBC: Brain of Britain 1988-- PROGRAM OF THE MONTH This long-running quiz show may be a bit tougher than "Jeopardy," but immensely entertaining nevertheless.
1830 Radio Netherlands: Happy Station (music and letters)
1900 BBC: News Summary
1901 BBC: Classical Record Review
1915 BBC: Feature or Drama
2000 BBC: World News
2000 RCI: News
2008 RCI: Listeners' Corner--(see Sunday 1808)
2009 BBC: Twenty-four Hours (news magazine)
2025 RAI: News
2030 BBC: Sunday Half-hour (religious feature)
2030 Radio Netherlands: Happy Station (music and letters)
2037 RAI: Songs from Italy
2100 BBC: News Summary
2101 BBC: Short Story
2115 BBC: The Pleasure's Yours (classical music requests)
2130 RCI: News
2138 RCI: Coast To Coast (topical discussion)
2200 BBC: World News
2200 RCI: News
2204 RCI: The House-Part I
2209 BBC: Reading
2225 BBC: Book Choice
2230 BBC: Financial Review
2240 BBC: Reflections
2245 BBC: Sports Roundup
2300 RCI: World News
2300 RCI: News
2308 RCI: SWL Digest--(see Sunday 0008)
2309 BBC: Commentary
2315 BBC: Letter from America
2330 BBC: Pillars of British Society
2330 RCI: The House-Part II

Your Guide to Shortwave Listening in July

Monday:

0000 BBC: World News
0000 RCI: News
0008 RCI: Listeners' Corner--(see Sunday 1808
0009 BBC: News about Britain
0015 BBC: Radio Newsreel
0030 BBC: Religious Service
0100 RAI: News
0100 BBC: News Summary
0100 RCI: News
0100 Radio Japan: News
0101 BBC: Drama or Feature
0108 RCI: Listeners' Corner--(see Sunday 1808)
0115 RAI: No Parking
0115 Radio Japan: Japan Travelogue
0145 BBC: Music Series
0200 BBC: World News
0209 BBC: British Press Review
0215 BBC: Peebles' Choice (music)
0230 BBC: Science in Action
0230 Radio Netherlands: Happy Station (music and letters)
0300 BBC: World News
0300 Radio Japan: News
0309 BBC: News about Britain
0315 BBC: Good Books
0315 Radio Japan: Japan Travelogue
0330 BBC: Anything Goes
0400 BBC: Newsdesk
0430 BBC: Reading
0445 BBC: Reflections (religion)
0450 BBC: Waveguide--(see Sunday 0750)
0500 BBC: World News
0509 BBC: Twenty-four Hours (news magazine)
0530 BBC: Nature Notebook
0530 Radio Netherlands: Happy Station (music and letters)
0545 BBC: Recording of the Week
0600 BBC: Newsdesk
0630 BBC: Pillars of British Society
0700 BBC: World News
0709 BBC: Twenty-four Hours (news magazine)
0730 BBC: Feature
0800 BBC: World News
0809 BBC: Reflections (religion)
0815 BBC: Reading
0830 BBC: Anything Goes (odd recordings)
0900 BBC: World News
0909 BBC: British Press Review
0915 BBC: Good Books
0930 BBC: Financial News
0930 RCI: News
0935 BBC: Sports Roundup
0945 BBC: Peebles' Choice
1000 BBC: News Summary
1001 BBC: Pillars of British Society
1030 BBC: The Vintage Chart Show
1100 BBC: World News
1109 BBC: News about Britain
1115 BBC: Health Matters
1130 BBC: The Ken Bruce Show (music mix with entertainment news)
1200 BBC: Radio Newsreel
1200 RCI: World Report
1215 BBC: Brain of Britain 1988--PROGRAM OF THE MONTH (see Sunday 1830)
1230 RCI: North Country
1245 BBC: Sports Roundup
1300 BBC: World News
1309 BBC: Twenty-four Hours (news magazine)
1330 BBC: Anything Goes (odd recordings)
1400 BBC: World News
1405 BBC: Outlook
1445 BBC: Reading
1500 BBC: Radio Newsreel
1515 BBC: Pillars of British Society
1545 BBC: Music Feature
1600 BBC: World News
1609 BBC: Commentary
1615 BBC: Talks
1630 BBC: The A-Z of Hollywood
1645 BBC: The World Today (news feature)
1700 BBC: World News
1709 BBC: Book Choice
1715 BBC: Classical Feature
1745 BBC: Sports Roundup
1800 BBC: Newsdesk
1800 RCI: News
1808 RCI: Spectrum
1830
BBC: Multitrack 1: Top 20--Pop music fans will enjoy comparing British trends in music to those of America
1830 Radio Netherlands: World News
1830 RCI: News
1835 Radio Netherlands: Newsline
1838 RCI: Spectrum
1850 Radio Netherlands: The Research File (science)
1900 BBC: News Summary
1900 RCI: News
1901 BBC: Outlook
1908 RCI: Spectrum
1945 BBC: Peebles' Choice
2000 BBC: World News
2000 RCI: News
2008 RCI: Spectrum
2009 BBC: Twenty-four Hours (news magazine)
2025 RAI: News
2030 BBC: Sports International (feature)
2030 Radio Netherlands: World News
2035 Radio Netherlands: Newsline
2037 RAI: For Orchestra Alone
2050 Radio Netherlands: The Research File (science)
2100 BBC: News Summary
2100 RCI: World at Six (national program news)
2101 BBC: Network UK (feature)
2115 BBC: Talks
2130 BBC: The Vintage Chart Show
2200 BBC: World News
2200 RCI: World at Six (national program news)
2209 BBC: The World Today (news feature)
2225 BBC: Book Choice
2230 BBC: Financial News
2240 BBC: Reflections (religion)
2245 BBC: Sports Roundup
2300 RCI: News
2300 BBC: World News
2308 RCI: Spectrum
2309 BBC: Commentary
2315 BBC: The Politics of Laughter (to 11th), Talks (from 18th)
2330 BBC: Multitrack 1: Top 20--(see Monday 1830
2330 RCI: As It Happens

Tuesday:

0000 BBC: World News
0009 BBC: News About Britain
0015 BBC: Radio Newsreel
0030 BBC: Classical Music Feature
0100 RAI: News
0100 BBC: News Summary
0100 RCI: News
0101 BBC: Outlook
0108 RCI: Spectrum
0115 RAI: Light Music
0130 BBC: Short Story
0145 BBC: Talks
0200 BBC: World News
0209 BBC: British Press Review
0215 BBC: Network UK (feature)
0230 BBC: Sports International (feature)
0230 Radio Netherlands: World News
0235 Radio Netherlands: Newsline
0250 Radio Netherlands: The Research File (science)
0300 BBC: World News
0309 BBC: News About Britain
0315 BBC: The World Today (news feature)
0330 BBC: John Peel (progressive rock music)
0400 BBC: Newsdesk
0430 BBC: Music Series
0445 BBC: Reflections (religion)
0450 BBC: Financial News
0500 BBC: World News
0509 BBC: Twenty-four Hours (news magazine)
0530 BBC: New Ideas
0530 Radio Netherlands: World News
0535 Radio Netherlands: Newsline
0540 BBC: Turning Over New Leaves (religious books)
0545 BBC: The World Today (news

feature)
0550 Radio Netherlands: The Research File (science)
0600 BBC: Newsdesk
0630 BBC: Counterpoint
0700 BBC: World News
0709 BBC: Twenty-four Hours (news magazine)
0730 BBC: Talks
0745 BBC: Network UK (feature)
0800 BBC: World News
0809 BBC: Reflections (religion)
0815 BBC: Talks
0830 BBC: Classical Music Feature
0900 BBC: World News
0909 BBC: British Press Review
0915 BBC: The World Today (news feature)
0930 BBC: Financial News
0930 RCI: News
0935 BBC: Sports Roundup
0945 BBC: Classical Music Feature
1000 BBC: News Summary
1001 BBC: Discovery (science)
1030 BBC: Sports International (feature)
1100 BBC: World News
1100 Radio Japan: News
1109 BBC: News About Britain
1115 BBC: Waveguide--(see Sunday 0750)
1116 Radio Japan: Commentary
1125 BBC: Book Choice
1126 Radio Japan: Tokyo Pop-In
1130 Radio Japan: Asia Now
1130 BBC: Citizens (drama serial)
1145 Radio Japan: Let's Learn Japanese
1200 BBC: Radio Newsreel
1200 RCI: World Report
1215 BBC: Multitrack 1: Top 20--(see Monday 1830)
1230 RCI: North Country
1245 BBC: Sports Roundup
1300 BBC: World News
1309 BBC: Twenty-four Hours (news magazine)
1330 BBC: Network UK (feature)
1345 BBC: Recording of the Week
1400 BBC: World News
1405 BBC: Outlook
1445 BBC: Music Series
1500 BBC: Radio Newsreel
1515 BBC: A Jolly Good Show (rock music)
1600 BBC: World News
1609 BBC: News About Britain
1615 BBC: Omnibus (topical feature)
1645 BBC: The World Today (news feature)
1700 BBC: World News
1609 BBC: News About Britain
1615 BBC: Omnibus (topical feature)
1645 BBC: The World Today (news feature)
1700 BBC: World News
1709 BBC: Commentary
1715 BBC: Citizens (drama serial)
1745 BBC: Sports Roundup
1800 BBC: Newsdesk
1800 RCI: News
1808 RCI: Spectrum
1830 BBC: Development '88
1830 Radio Netherlands: World News
1830 RCI: News
1835 Radio Netherlands: Newsline
1838 RCI: Spectrum
1850 Radio Netherlands: Images (arts feature)
1900 BBC: News Summary
1900 RCI: News
1901 BBC: Outlook
1908 RCI: Spectrum
1939 BBC: Stock Market Report
1945 BBC: Report on Religion
2000 BBC: World News
2000 RCI: News
2008 RCI: Spectrum
2009 BBC: Twenty-four Hours (news magazine)
2025 RAI: News
2030 BBC: Meridian (arts feature)
2030 Radio Netherlands: World News
2035 Radio Netherlands: Newsline
2037 RAI: Light Music
2050 Radio Netherlands: Images (art feature)
2100 BBC: News Summary
2100 RCI: World at Six (national program news)
2101 BBC: Talks
2110 BBC: Turning Over New Leaves (religious books)
2115 BBC: Feature
2145 BBC: Pop Music
2200 BBC: World News
2200 RCI: World at Six (national program news)
2209 BBC: The World Today (news feature)
2225 BBC: Book kChoice
2230 BBC: Financial News
2240 BBC: Reflections (religion)
2245 BBC: Sports Roundup
2300 BBC: World News
2300 RCI: News
2308 RCI: Spectrum
2309 BBC: Commentary
2315 BBC: Concert Hall
2330 RCI: As It Happens

Wednesday:

0000 BBC: World News
0009 BBC: News About Britain
0015 BBC: Radio Newsreel
0030 BBC: Omnibus (topical feature)
0100 BBC: News Summary
0100 RAI: News
0100 RCI: News
0101 BBC: Outlook
0108 RCI: Spectrum
0115 RAI: Window on the Bay
0130 BBC: Report on Religion
0145 BBC: Country Style
0200 BBC: World News
0209 BBC: British Press Review
0215 BBC: The A-Z of Hollywood
0230 BBC: Citizens (drama serial)
0230 Radio Netherlands: World News
0235 Radio Netherlands: Newsline
0250 Radio Netherlands: Images (art feature)
0300 BBC: World News
0309 BBC: News About Britain
0315 BBC: The World Today (news feature)
0330 BBC: Discovery (science)
0400 BBC: Newsdesk
0430 BBC: Talks
0445 BBC: Reflections (religion)
0450 BBC: Financial News
0500 BBC: World News
0509 BBC: Twenty-four Hours (news magazine)
0530 BBC: Report on Religion
0530 Radio Netherlands: World News
0535 Radio Netherlands: Newsline
0545 BBC: The World Today (news feature)
0550 Radio Netherlands: Images (art feature)
0600 BBC: Newsdesk
0630 BBC: Meridian (arts feature)
0700 BBC: World News
0709 BBC: Twenty-four Hours (news magazine)
0730 BBC: Development '88
0800 BBC: World News
0809 BBC: Reflections (religion)
0815 BBC: Classical Record Review
0830 BBC: Brain of Britain 1988--PROGRAM OF THE MONTH (see Sunday 1830)
0900 BBC: World News
0909 BBC: British Press Review
0915 BBC: The World Today (news feature)
0930 BBC: Financial News
0930 RCI: News
0935 BBC: Sports Roundup
0945 BBC: Music Feature
1000 BBC: News Summary
1001 BBC: Omnibus (topical feature)
1030 BBC: A Word In Edgeways (discussion)
1100 BBC: World News
1109 BBC: News About Britain
1115 BBC: Talks
1130 BBC: Meridian (arts feature)
1200 BBC: Radio Newsreel
1200 RCI: World Report
1215 BBC: Talks
1225 BBC: The Farming World

Your Guide to Shortwave Listening in July

1230 RCI: North Country
1245 BBC: Sports Roundup
1300 BBC: World News
1309 BBC: Twenty-four Hours (news magazine)
1330 BBC: Development '88
1400 BBC: World News
1405 BBC: Outlook
1445 BBC: Report on Religion
1500 BBC: Radio Newsreel
1515 BBC: The Politics of Laughter (to 13th), Talks (from 20th)
1530 BBC: RAdio Active (comedy)
1600 BBC: World News
1609 BBC: News About Britain
1615 BBC: Counterpoint
1645 BBC: The World Today (news feature)
1700 BBC: World News
1709 BBC: Commentary
1715 BBC: Society Today
1730 BBC: New Ideas
1740 BBC: Book Choice
1745 BBC: Sports Roundup
1800 BBC: Newsdesk
1800 RCI: News
1808 RCI: Spectrum
1830 BBC: Multitrack 2--Simon Mayo presents pop music and news. You could get about as much from thirty minutes of "MTV."
1830 Radio Netherlands: World News
1830 RCI: News
1835 Radio Netherlands: Newsline
1838 RCI: Spectrum
1850 Radio Netherlands: The Savage Breast (music feature)
1900 BBC: News Summary
1900 RCI: News
1901 BBC: Outlook
1908 RCI: Spectrum
1939 BBC: Stock Market Report
1945 BBC: Good Books
2000 BBC: World News
2000 RCI: News
2008 RCI: Spectrum
2009 BBC: Twenty-four Hours (news magazine)
2025 RAI: News
2030 BBC: Assignment
2030 Radio Netherlands: World News
2035 Radio Netherlands: Newsline
2037 RAI: Operatic Arias
2050 Radio Netherlands: The Savage Breast (music feature)
2100 BBC: News Summary
2100 RCI: World at Six (national program news)
2101 BBC: Network UK (feature)
2115 BBC: Counterpoint
2145 BBC: Recording of the Week
2200 BBC: World News
2200 RCI: World at Six (national program news)
2209 BBC: The World Today (news feature)
2225 BBC: Talks
2230 BBC: Financial News
2240 BBC: Reflections (religion)
2245 BBC: Sports Roundup
2300 BBC: World News
2300 RCI: News
2308 RCI: Spectrum
2309 BBC: Commentary
2315 BBC: Write On . . . (letters)
2330 BBC: Multitrack 2--(see Wednesday 1830
2330 RCI: As It Happens

Thursday:

0000 BBC: World News
0009 BBC: News About Britain
0015 BBC: Radio Newsreel
0030 BBC: Radio Active (comedy)
0100 BBC: News Summary
0100 RCI: News
0100 RAI: News
0101 BBC: Outlook
0108 RCI: Spectrum
0115 RAI: Light Music
0130 BBC: Waveguide--(see Sunday 0750)
0140 BBC: Book Choice
0145 BBC: Society Today
0200 BBC: World News
0209 BBC: British Press Review
0215 BBC: Network UK (feature)
0230 BBC: Assignment
0230 Radio Netherlands: World News
0235 Radio Netherlands: Newsline
0250 Radio Netherlands: The Savage Breast (music feature)
0300 BBC: World News
0309 BBC: News About Britain
0315 BBC: The World Today (news feature)
0330 BBC: Feature
0400 BBC: Newsdesk
0430 BBC: Classical Record Review
0445 BBC: Reflections (religion)
0450 BBC: Financial News
0500 BBC: World News
0509 BBC: Twenty-four Hours (news magazine)
0530 BBC: Peebles' Choice
0530 Radio Netherlands: World News
0535 Radio Netherlands: Newsline
0545 BBC: The World Today (news feature)
0550 Radio Netherlands: The Savage Breast (music feature)
0600 BBC: Newsdesk
0630 BBC: Talks
0640 BBC: The Farming World
0700 BBC: World News
0709 BBC: Twenty-four Hours (news magazine)
0730 BBC: Pop Music
0745 BBC: Network UK (feature)
0800 BBC: World News
0809 BBC: Reflections (religion)
0815 BBC: Country Style
0830 BBC: John Peel (progressive rock music)
0900 BBC: World News
0909 BBC: British Press Review
0915 BBC: The World Today (news feature)
0930 BBC: Financial News
0930 RCI: News
0935 BBC: Sports Roundup
0945 BBC: Society Today
1000 BBC: News Summary
1001 BBC: Assignment
1030 BBC: Radio Active (comedy)
1100 BBC: World News
1109 BBC: News About Britain
1115 BBC: New Ideas
1125 BBC: A Letter from England
1130 BBC: Citizens (drama serial)
1200 BBC: Radio Newsreel
1200 RCI: World Report
1215 BBC: Multitrack 2--(see Wednesday 1830)
1230 RCI: North Country
1245 BBC: Sports Roundup
1300 BBC: World News
1309 BBC: Twenty-four Hours (news magazine)
1330 BBC: Network UK (feature)
1345 BBC: Folk/Jazz Music
1400 BBC: World News
1405 BBC: Outlook
1445 BBC: Write On . . . (letters)
1500 BBC: Radio Newsreel
1515 BBC: The Pleasure's Yours (classical music requests)
1515 WRNO: World of Radio--(see Sunday 1800
1600 BBC: World News
1609 BBC: News About Britain
1615 BBC: Assignment
1645 BBC: The World Today (news feature)
1700 BBC: World News
1709 BBC: Commentary
1715 BBC: Citizens (drama serial)
1745 BBC: Sports Roundup
1800 BBC: Newsdesk
1800 RCI: News
1808 RCI: Spectrum
1830 BBC: Discovery (science)
1830 Radio Netherlands: World News
1830 RCI: News
1835 Radio Netherlands: Newsline
1838 RCI: Spectrum
1850 Radio Netherlands: Media Network--Probably the best SW radio program on the air overall. Features mixed with SW news; heavy European coverage.
1900 BBC: News Summary

Your Guide to Shortwave Listening in July

1900 RCI: News
1901 BBC: Outlook
1908 RCI: Spectrum
1939 BBC: Stock Market Report
1945 BBC: Here's Humph!
2000 BBC: World News
2000 RCI: News
2008 RCI: Spectrum
2009 BBC: Twenty-four Hours (news magazine)
2025 RAI: News
2030 BBC: Meridian
2030 Radio Netherlands: World News
2035 Radio Netherlands: Newsline
2037 RAI: Musical Excursion
2050 Radio Netherlands: Media Network--(see Thursday 1850)
2100 BBC: News Summary
2100 RCI: World at Six (national program news)
2101 BBC: Talking From . . . (Northern Ireland, Scotland, Wales)
2115 BBC: A Jolly Good Show (rock music)
2200 RCI: World at Six (national program news)
2200 BBC: World News
2209 BBC: The World Today (news feature)
2225 BBC: Book Choice
2230 BBC: Financial News
2240 BBC: Reflections (religion)
2245 BBC: Sports Roundup
2300 BBC: BBC: World News
2308 RCI: Spectrum
2309 BBC: Commentary
2315 BBC: Seven Seas
2330 BBC: Talks
2330 RCI: As It Happens
2340 BBC: The Farming World

Friday:

0000 BBC: World News
0009 BBC: News About Britain
0015 BBC: Radio Newsreel
0030 BBC: Music Now (modern classical music)
0030 WRNO: World of Radio--(see Sunday 1800)
0100 BBC: News Summary
0100 RCI: News
0100 RAI: News
0101 BBC: Outlook
0108 RCI: Spectrum
0115 RAI: Light Music
0130 BBC: Folk/Jazz Music
0145 BBC: Talking From . . . (Northern Ireland, Scotland, Wales)
0200 BBC: World News
0209 BBC: British Press Review
0215 BBC: Health Matters
0230 BBC: Citizens (drama serial)
0230 Radio Netherlands: World News
0235 Radio Netherlands: Newsline
0250 Radio Netherlands: Media Network--(see Thursday 1850
0300 BBC: World News
0309 BBC: News About Britain
0315 BBC: Thke World Today (news feature)
0330 BBC: The Vintage Chart Show
0400 BBC: Newsdesk
0430 BBC: Country Style
0445 BBC: Reflections (religion)
0450 BBC: Financial News
0500 BBC: World News
0509 BBC: Twenty-four Hours (news magazine)
0530 BBC: The Politics of Laughter (to 15th), Talks (from 22nd)
0530 Radio Netherlands: World News
0535 Radio Netherlands: Newsline
0545 BBC: The World Today (news feature)
0550 Radio Netherlands: Media Network--(see Thursday 1850)
0600 BBC: Newsdesk
0630 BBC: Meridian (arts feature)
0700 BBC: World News
0709 BBC: Twenty-four Hours (news magazine)
0730 BBC: Write On . . . (letters)
0745 BBC: Seven Seas
0800 BBC: World News
0809 BBC: Reflections (religion)
0815 BBC: Music Series
0830 BBC: Music Now (modern classical music)
0900 BBC: World News
0909 BBC: British Press Review
0915 BBC: The World Today (news feature)
0930 BBC: Financial News
0930 RCI: News
0935 BBC: Sports Roundup
0945 BBC: Reading
1000 BBC: News Summary
1001 BBC: Pop Music
1030 BBC: Jazz Program
1100 BBC: World News
1100 Radio Japan: This Week
1109 BBC: News About Britain
1115 BBC: Talking From . . .(Northern Ireland, Scotland, Wales)
1130 BBC: Meridian (arts feature)
1200 BBC: Radio Newsreel
1200 RCI: World Report
1215 BBC: Europe's World
1230 BBC: Business Matters
1230 RCI: North Country
1245 BBC: Sports Roundup
1300 BBC: World News
1309 BBC: Twenty-four Hours (news magazine)
1330 BBC: John Peel (progressive rock music).
1400 BBC: World News
1405 BBC: Outlook
1445 BBC: Nature Notebook
1500 BBC: Radio Newsreel
1515 BBC: Feature/Drama
1600 BBC: World News
1609 BBC: News About Britain
1615 BBC: Science in Action
1645 BBC: The World Today (news feature)
1700 BBC: World News
1709 BBC: Commentary
1715 BBC: Music Now (modern classical music)
1745 BBC: Sports Roundup
1800 BBC: Newsdesk
1800 RCI: News
1808 RCI: Spectrum
1830 BBC: Multitrack 3--Quite different from the other two editions, and the best of the lot. Sarah Ward presents new and innovative rock before it makes the charts.
1830 Radio Netherlands: World News
1830 RCI: News
1835 Radio Netherlands: Newsline
1838 RCI: Spectrum
1850 Radio Netherlands: Rembrandt Express (magazine)
1900 BBC: News Summary
1900 RCI: News
1901 BBC: Outlook
1908 RCI: Spectrum
1939 BBC: Stock Market Report
1945 BBC: Personal View
2000 BBC: World News
2000 RCI: News
2008 RCI: Spectrum
2009 BBC: Twenty-four Hours (news magazine)
2025 RAI: News
2030 BBC: Science in Action
2030 Radio Netherlands: World News
2035 Radio Netherlands: Newsline
2037 RAI: Piano Pages
2050 Radio Netherlands: Rembrandt Express (magazine)
2100 BBC: News Summary
2100 RCI: World at Six (national program news)
2101 BBC: Network UK feature
2115 BBC: Europe's World
2130 BBC: Business Matters
2145 BBC: Reading
2200 BBC: World News
2200 RCI: World at Six (national program news)
2209 BBC: The World Today (news feature)
2225 BBC: Talks
2230 BBC: Financial News
2240 BBC: Reflections (religion)
2245 BBC: Sports Roundup
2300 BBC: World News
2300 RCI: News

Your Guide to Shortwave Listening in July

2308 RCI: Spectrum
2309 BBC: Commentary
2315 BBC: From The Weeklies (press review)
2330 BBC: Multitrack 3--(see Friday 1830)
2330 RCI: As It Happens

Saturday:

0000 BBC: World News
0009 BBC: News About Britain
0015 BBC: Radio Newsreel
0030 BBC: Personal View
0045 BBC: Recording of the Week
0100 BBC: News Summary
0100 RCI: News
0100 RAI: News
0101 BBC: Outlook
0108 RCI: Spectrum
0115 RAI: Contrast in Music
0130 BBC: Pop Music
0145 BBC: Nature Notebook
0200 BBC: World News
0209 BBC: Commentary
0215 BBC: Network UK (feature)
0230 BBC: People and Politics
0230 Radio Netherlands: World News
0235 Radio Netherlands: Newsline
0250 Radio Netherlands: Rembrandt Express (magazine)
0300 BBC: World News
0300 WRNO: World of Radio--(see Sunday 1800)
0309 BBC: News About Britain
0315 BBC: The World Today (news feature)
0330 BBC: Europe's World
0345 BBC: Business Matters
0400 BBC: Newsdesk
0430 BBC: Here's Humph!
0445 BBC: Reflections (religion)
0450 BBC: Financial News
0500 BBC: World News
0509 BBC: Twenty-four Hours (news magazine)
0530 BBC: Personal View
0530 Radio Netherlands: World News
0535 Radio Netherlands: Newsline
0545 BBC: Thke World Today (news feature)
0550 Radio Netherlands: Rembrandt Express (magazine)
0600 BBC: Newsdesk
0630 BBC: Meridian (arts feature)
0700 BBC: World News
0709 BBC: Twenty-four Hours (news magazine)
0730 BBC: From the Weeklies (press review)
0745 BBC: Network UK (feature)
0800 BBC: World News
0809 BBC: Reflections (religion)
0815 BBC: A Jolly Good Show (rock music)
0900 BBC: World News
0909 BBC: British Press Review
0915 BBC: The World Today (news feature)
0930 BBC: Financial News
0935 BBC: Sports Roundup
0945 BBC: Personal View
1000 BBC: News Summary
1001 BBC: Here's Humph!
1015 BBC: Letter From America
1030 BBC: People and Politics
1100 BBC: World News
1109 BBC: News About Britain
1115 BBC: The A-Z of Hollywood
1130 BBC: Meridian (arts feature)
1200 BBC: Radio Newsreel
1200 RCI: Canadian Journal
1215 BBC: Multitrack 3--(see Friday 1830)
1245 BBC: Sports Roundup
1300 BBC: World News
1309 BBC: Twenty-four Hours (news magazine
1330 BBC: Network UK (feature)
1345 BBC: Sportsworld
1400 BBC: News Summary
1401 BBC: Sportsworld
1500 BBC: Radio Newsreel
1515 BBC: Sprtsworld
1600 BBC: World News
1609 BBC: News About Britain
1615 BBC: Sportsworld
1700 BBC: World News
1709 BBC: Words
1715 BBC: The Ken Bruce Show (music mix with entertainment news)
1745 BBC: Sports Roundup
1800 BBC: Newsdesk
1800 RCI: News
1808 RCI: Innovation Canada
1830 BBC: Music Series
1830 Radio Netherlands: World News
1830 RCI: Canada Rocks
1835 Radio Netherlands: Newsline
1838 RCI: Spotlight on Science
1850 Radio Netherlands: Over To You (letters)
1900 BBC: News Summary
1901 BBC: Play of the Week
2000 BBC: World News
2000 RCI: News
2008 RCI: SWL Digest--(see Sunday 0008)
2009 BBC: Twenty-four Hours (news magazine)
2025 RAI: News
2030 BBC: Meridian (arts feature)
2030 Radio Netherlands: World News
2030 RCI: Canada Rocks
2035 Radio Netherlands: Newsline
2037 RAI: Ciao Italy
2038 RCI: Innovation Canada
2050 Radio Netherlands: Over To You! (letters)
2100 BBC: News Summary
2130 BBC: People and Politics
2130 RCI: News
2138 RCI: SWL Digest--(see Sunday 0008)
2200 BBC: World News
2200 RCI: News
2208 RCI: Innovation Canada
2209 BBC: From Our Own Correspondent
2225 BBC: Nature Notebook
2230 BBC: New Ideas
2240 BBC: Reflections (religion)
2245 BBC: Sports Roundup
2300 BBC: World News
2300 RCI: News
2308 RCI: Innovation Canada
2309 BBC: Words
2315 BBC: The Tony Myatt Request Show
2330 RCI: News
2330 WRNO: World of Radio--(see Sunday 1800)
2338 RCI: Coast to Coast (topical discussion)

MT reader Giorgio Romanin from Udine, Italy, at his listening post. Gear consists of Yaesu FRG-7700, Barlow Wadley XCR-30, Yaesu FRT Antenna Tuner, Auteck Q-1A audio filter and Ant Farm Sky-Raider antenna.

frequency SECTION

MT Monitoring Team

EAST COAST:

Greg Jordan, Frequency Manager

1855-I Franciscan Terrace
Winston-Salem, NC 27127

Joe Hanlon, PA

WEST COAST:

Bill Brinkley, CA

0000 UTC [8:00 PM EDT/5:00 PM PDT]

0000-0015		Voice of Kampuchea, Phnom-Penh	9693	11938		
0000-0030		BBC, London, England	5975	6005	6175	7325
			9515	9580	9590	9915
			12095	11955		
0000-0030		Kol Israel, Jerusalem	9435	11605	12080	
0000-0030		Radio Berlin Int'l, East Germany	6080	9730		
0000-0030		Radio Korea, Seoul, South Korea	15575			
0000-0030	M	Radio Norway Int'l, Oslo	9620	11840		
0000-0030	S,M	WINB, Red Lion, Pennsylvania	15145			
0000-0050		Radio Pyongyang, North Korea	15115	15160		
0000-0055		Radio Beijing, PR China	9770	11715	15455	
0000-0100		(US) Armed Forces Radio and TV	6030	11790	15345	
0000-0100		All India Radio, New Delhi	6055	7215	9535	9910
			11715	11745	15110	
0000-0100		CBC Northern Quebec Service	6195	9625		
0000-0100		CBN, St. John's, Newfoundland	6160			
0000-0100		CBU, Vancouver, British Colombia	6160			
0000-0100		CFCF, Montreal, Quebec	6005			
0000-0100		CFCN, Calgary, Alberta	6030			
0000-0100		CHNS, Halifax, Nova Scotia	6130			
0000-0100		CKWX, Vancouver, British Colombia	6080			
0000-0100		CFRB, Toronto, Ontario	6070			
0000-0100		FEBC, Manila, Philippines	15445			
0000-0100		(US) Far East Network, Tokyo	3910			
0000-0100		KSDA, Guam	15125			
0000-0100	T-A	KVOH, Rancho Simi, California	9495			
0000-0100		KYOI, Saipan	15405			
0000-0100		Radio Australia, Melbourne	15140	15160	15240	15320
			15395	17750	17795	
0000-0100		Radio Baghdad, Iraq	11775	11810		
0000-0100	S,M	Radio Canada Int'l, Montreal	5960	9755		
0000-0100		Radio Havana Cuba	9655			
0000-0100		Radio Luxembourg	6090			
0000-0100		Radio Moscow, USSR	9530	9600	9610	9700
			9765	9865	11710	11750
			11780	12060	15245	15425
0000-0100		Radio Moscow World Service	17570	17635	17740	17850
			17860			
0000-0100		Radio New Zealand, Wellington	15150	17705		
0000-0100		Radio for Peace, Costa Rica	7375v			
0000-0100		Radio Thailand, Bangkok	9655	11905		
0000-0100		SBC Radio One, Singapore	5010	5052	11940	
0000-0100		Spanish Foreign Radio, Madrid	9630	11880		
0000-0100	T-S	Superpower KUSW, Utah	15580			
0000-0100		Voice of America, Washington	5995	6130	9455	9775
			9815	11580	11695	11740
			15205			
0000-0100	T-A	Voice of Nicaragua, Managua	6100			
0000-0100		WCSN, Boston, Massachusetts	9852.5			
0000-0100		WHRI, Noblesville, Indiana	7400	9495		
0000-0100		WRNO New Orleans, Louisiana	7355			
0000-0100		WYFR, Oakland, California	5950	6085	9680	
0000-0100	T-A	WYFR Satellite Net, California	9505			
0030-0045		BBC, London, England*	6195	7235	9570	11820
			15435			
0030-0100		BBC, London, England	5965	5975	6005	6120
			6175	7135	7325	9515
			9580	9915	9590	11955
			12095	15435		
0030-0100		HCJB, Quito, Ecuador	9720	11775	11910	15155
0030-0100		Radio Austria Int'l, Vienna	9875			
0030-0100		Radio Budapest, Hungary	6110	9520	9585	9835
			11910	15160		
0030-0100		SLBC, Colombo, Sri Lanka	6005	9720		
0030-0100		WINB, Red Lion, Pennsylvania	15145			

LEGEND

- The first four digits of an entry are the broadcast start time in UTC. The second four digits represent the end time.
- In the space between the end time and the station name is the broadcast schedule.

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

If there is no entry, the broadcasts are heard daily. If, for example, there is an entry of "M," the broadcast would be heard only on Mondays. An entry of "M,W,F" would mean Mondays, Wednesdays and Fridays only. "M-F" would mean Mondays through Fridays. "TEN" indicates a tentative schedule and "TES" a test transmission.

- [ML] after a frequency indicates a multi-lingual transmission containing English-language programs.
- The last entry on a line is the frequency. Codes here include "SSB" which indicates a Single Sideband transmission, and "V" for a frequency that varies. [ML] after a frequency indicates a multi-lingual transmission containing English-language programs.
- v after a frequency indicates that it varies
- Notations of USB and LSB (upper and lower sideband transmissions) usually refer only to the individual frequency after which they appear.
- Listings followed by an asterisk (*) are for English lessons and do not contain regularly scheduled programming.

We suggest that you begin with the lower frequencies that a station is broadcasting on and work your way up the dial. Remember that there is no guarantee that a station will be audible on any given day. Reception conditions can change rapidly, though, and if it is not audible one night, it may well be on another.

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 (the are divided into east coast, midwest and west coast of North America). Then look for the one most closely describing the geographic location of the station you want to hear.

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 Useable Frequency [MUF] and the lower line the Lowest Useable Frequency [LUF] as indicated on the vertical axis of the graph.

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!

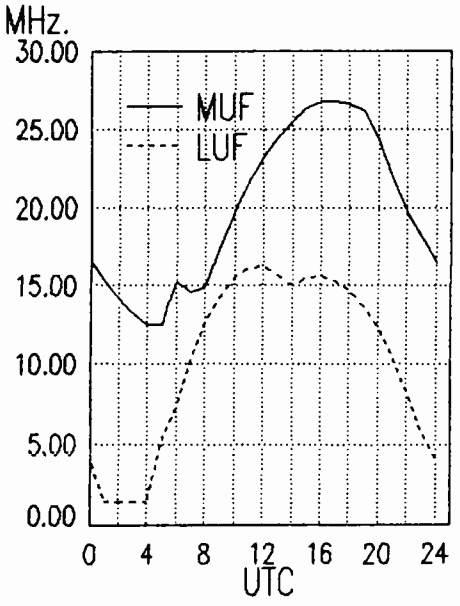
frequency SECTION

0035-0040		All India Radio, New Delhi	3925	4860		
0045-0100	A	Radio New Zealand, Wellington	15150	17705		
0050-0100		Vatican Radio, Vatican City	6150	9605	11780	

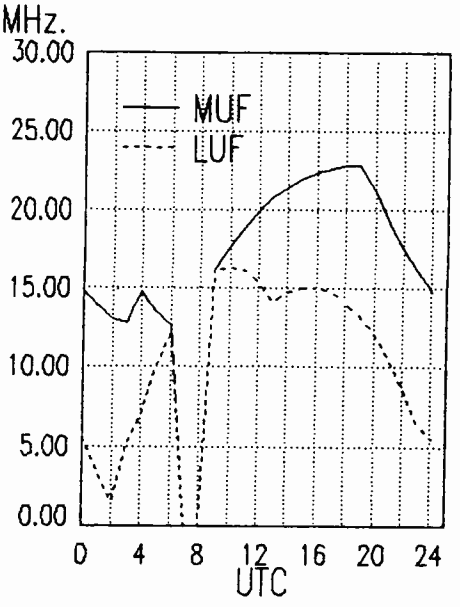
0100 UTC [9:00 PM EDT/6:00 PM PDT]

0100-0103	S	Port Moresby, Papua New Guinea	3295	4890	5960	5985
			6020	6040	6080	6140
			9520			
0100-0110		Vatican Radio, Vatican City	6150	9605	11780	
0100-0115		All India Radio, New Delhi	6055	7215	9535	9910
			11715	11745	15110	
0100-0120		RAI, Rome, Italy	9575	11800		
0100-0125		Kol Israel, Jerusalem	9435	11605	12080	
0100-0130	W,A	Radio Budapest, Hungary	6110	9520	9585	9835
			11910	15160		
0100-0130		Radio Japan, Tokyo	15280	17810	17835	17845
0100-0130		Laotian National Radio	7113v			
0100-0145		Radio Berlin Iny'l, E. Germany	6080	9620	9730	11785
0100-0150		Deutsche Welle, West Germany	6040	6085	6145	9565
			9735	11865		
0100-0150		Radio Baghad, Iraq	11775	11810		
0100-0155		Radio Austria Int'l, Vienna	9875			
0100-0200		(US) Armed Forces Radio and TV	6030	11790	15345	
0100-0200		BBC, London, England	5975	6005	6120	6175
			7325	9515	9590	9915
			9975			
0100-0200		CBC Northern Quebec Service	6195	9625		
0100-0200		CBN, St. John's, Newfoundland	6160			
0100-0200		CBU, Vancouver, British Colombia	6160			
0100-0200		CFCF, Montreal, Quebec	6005			
0100-0200		CFCN, Calgary, Alberta	6030			
0100-0200		CHNS, Halifax, Nova Scotia	6130			
0100-0200		CKWX, Vancouver, British Colombia	6080			
0100-0200		CFRB, Toronto, Ontario	6070			
0100-0200		(US) Far East Network, Tokyo	3910			
0100-0200		FEBC, Manila, Philippines	15445			
0100-0200		HCJB, Quito, Ecuador	9720	11775	15115	
0100-0200	T-A	KVOH, Rancho Simi, California	17775			
0100-0200		KYOI, Saipan	15405			
0100-0200		Radio Australia, Melbourne	15160	15180	15240	15320
			15395	17715	17795	
			17750			
0100-0200		Radio Canada Int'l, Montreal	9735	9755	11845	11940
0100-0200		Radio Havana Cuba	9655			
0100-0200		Radio Japan, Tokyo	5960	11815	17810	
0100-0200		Radio Luxembourg	6090			
0100-0200		Radio Moscow, USSR	9530	9600	9610	9700
			9765	9865	11710	11750
			11780	11860	12060	15245
			15425	15455		
0100-0200		Radio Moscow World Service	17570	17675	17685	17740
			17850	17860	17880	
0100-0200		Radio New Zealand, Wellington	12045	15150		
0100-0200		Radio for Peace, Costa Rica	7375			
0100-0200		Radio Prague, Czechoslovakia	5930	6055	7345	9540
			9630	9740	11990	
0100-0200		Radio Thailand, Bangkok	9655	11905		
0100-0200		SBC Radio One, Singapore	5010	5052	11940	
0100-0200		SLBC, Colombo, Sri Lanka	6005	9720	15425	
0100-0200		Spanish Foreign Radio, Madrid	9630	11880		
0100-0200	T-S	Superpower KUSW, Utah	11695			
0100-0200		Voice of America, Washington	5995	6130	7205	9455
			9775	9815	11580	11740
			15160	15205	17735	
0100-0200		Voice of Indonesia, Jakarta	9680	11790		
0100-0200		WCSN, Boston, Massachusetts	9852.5			
0100-0200		WINB, Red Lion, Pennsylvania	15145			
0100-0200		WHRI, Noblesville, Indiana	7400	9495		
0100-0200		WRNO, New Orleans, Louisiana	7355			
0100-0200		WYFR, Oakland, California	5950	7440	9680	
0100-0200	T-S	WYFR Satellite Net, California	9505			
0130-0140	T-S	Voice of Greece, Athens	7430	9420	11645	
0130-0145	TWFS	Radio Budapest, Hungary	6110	9520	9585	9835
			11910	15160		
0130-0155	S	Radio Austria Int'l, Vienna	9875			
0130-0200		Radio Veritas Asia, Philippines	15330	15365		

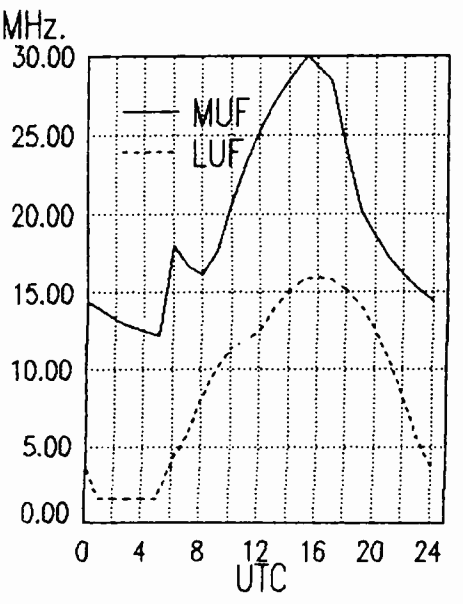
East Coast To Central Africa



East Coast To East Africa



East Coast To South Africa



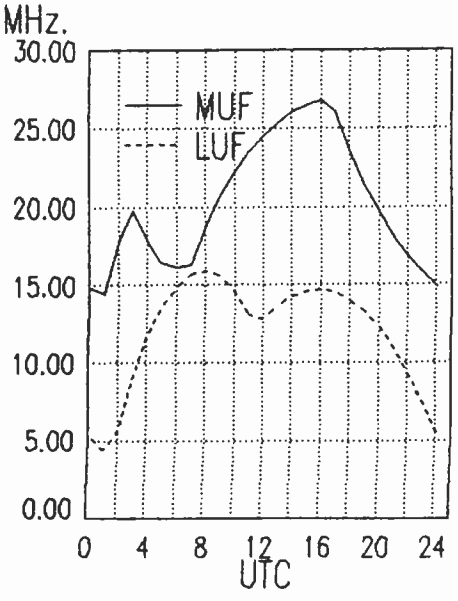
frequency SECTION

0145-0200		Radio Berlin Int'l, E. Germany	6080	9620	9730	11785
0145-0200		Radio Korea, Seoul, South Korea	7275	15375		

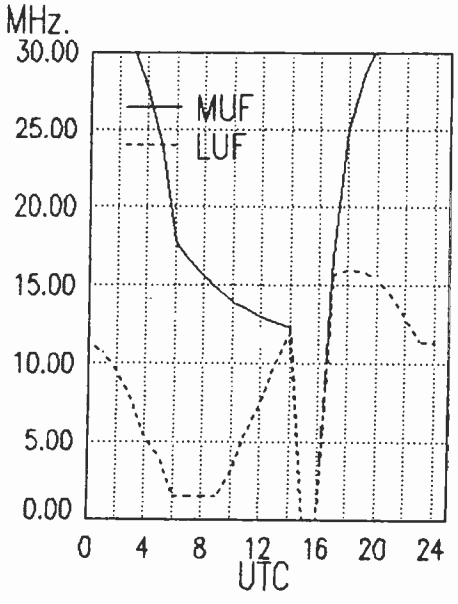
0200 UTC [10:00 PM EDT/7:00 PM PDT]

0200-0215		Vatican Radio, Vatican City	7125	9650		
0200-0230		BBC, London, England	5975	6005	6175	7325
			9410	9515	9590	9915
0200-0230		Burma Bcasting Service, Rangoon	7185			
0200-0230	S	Radio Austria Int'l, Vienna	9875			
0200-0230		Radio Berlin Int'l, E. Germany	6080	9620	9730	11785
0200-0230		Radio Kiev, Ukrainian SSR	9640	9800	11790	13645
			15180	15455		
0200-0230		Swiss Radio Int'l, Berne	5965	6135	9725	9885
			12035			
0200-0230		WINB, Red Lion, Pennsylvania	15145			
0200-0250		Deutsche Welle, West Germany	6035	7285	9690	11945
0200-0250		Radio Bras, Brasilia, Brazil	11745v			
0200-0255		Radio Bucharest, Romania	5990	6155	9510	9570
			11810	11940		
0200-0255		RAE, Buenos Aires, Argentina	9690	11710		
0200-0300		(US) Armed Forces Radio and TV	6030	11790	15345	
0200-0300		CBC Northern Quebec Service	6195	9625		
0200-0300		CBN, St. John's, Newfoundland	6160			
0200-0300		CBU, Vancouver, British Colombia	6160			
0200-0300		CFCF, Montreal, Quebec	6005			
0200-0300		CFCN, Calgary, Alberta	6030			
0200-0300		CFRB, Toronto, Ontario	6070			
0200-0300		CHNS, Halifax, Nova Scotia	6130			
0200-0300		CKWX, Vancouver, British Colombia	6080			
0200-0300		(US) Far East Network, Tokyo	3910			
0200-0300		HCJB, Quito, Ecuador	9720	11775	15155	
0200-0300	T-A	KVOH, Rancho Simi, California	17775			
0200-0300		KSDA, Guam	17865			
0200-0300		Radio Australia, Melbourne	15180	15240	15320	17715
			17750	17795		
0200-0300		Radio Cairo, Egypt	9475	9675		
0200-0300		Radio Havana Cuba	6140			
0200-0300		Radio Korea (South), Seoul	7275	15575		
0200-0300		Radio Luxembourg	6090			
0200-0300		Radio Moscow, USSR	9530	9600	9610	
			9765	9700	9865	11710
			11750	12060	15245	15425
			15455			
0200-0300		Radio Moscow World Service, USSR	17570	17740	17600	17675
			17685	17850	17860	17880
0200-0300		Radio Orion, South Africa	3955			
0200-0300		Radio for Peace, Costa Rica	7375v			
0200-0300	A	Radio New Zealand, Wellington	15150	17705		
0200-0300		Radio Polonia, Warsaw, Poland	6095	6135	7145	7270
			9525	11815	15120	
0200-0300		Radio RSA, South Africa	6010	9580	9615	
0200-0300		Radio Thailand, Bangkok	9655	11905		
0200-0300		SBC Radio One, Singapore	5010	5052	11940	
0200-0300		SLBC, Colombo, Sri Lanka	6005	9720	15425	
0200-0300	T-S	Superpower KUSW, Utah	11695			
0200-0300		Voice of America, Washington	5995	7205	9650	9775
			9815	11580	11745	15205
0200-0300		Voice of Asia, Taiwan	7285			
0200-0300		Voice of Free China, Taiwan	5985	7445	9680	11740
			11860	15345		
0200-0300		Voice of Kenya, Nairobi	6045			
0200-0300		WCSN, Boston, Massachusetts	9852.5			
0200-0300		WHRI, Noblesville, Indiana	7400	9495		
0200-0300		WRNO, New Orleans, Louisiana	7355			
0200-0300		WYFR, Oakland, California	5950			
0200-0300		WYFR Satellite Net, California	9505			
0215-0220		Radio Nepal, Kathmandu	5005	7165		
0230-0240		Port Moresby, Papua New Guinea	3925	4890	5960	5985
			6020	6040	6080	6140
			9520			
0230-0245		Radio Pakistan, Islamabad	7010	11570	15115	15580
			17660			
0230-0300		BBC, London, England	5975	6005	6175	7325
			9410	9515	9660	9845
			9915	11955		
0230-0300		Radio Finland, Helsinki	9635	11945		

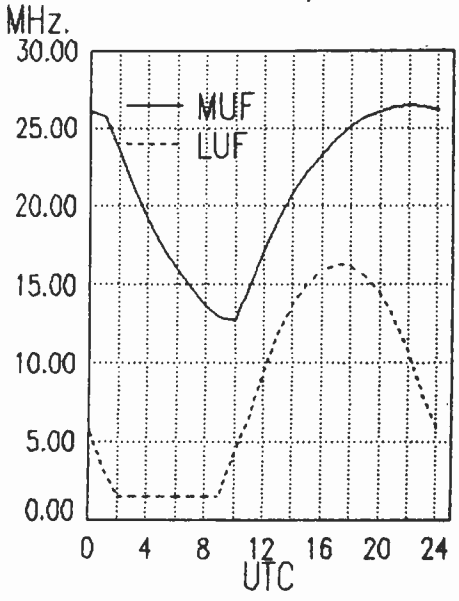
East Coast To
Indian Ocean



East Coast To
Pacific



East Coast To
Central America/Caribbean



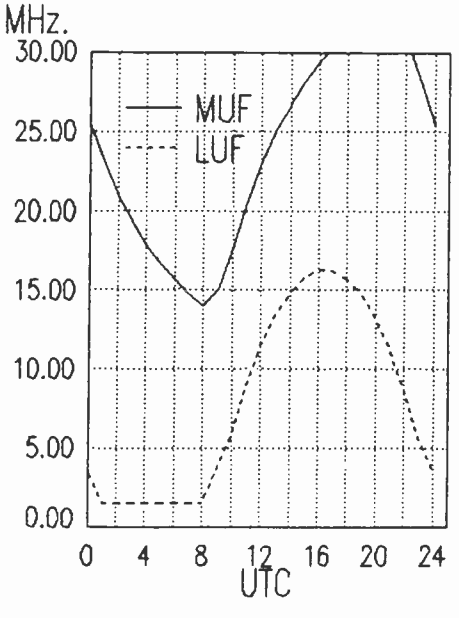
frequency SECTION

0230-0300		Radio Netherland, Hilversum	6020	6165	9590	9895
0230-0300	T-A	Radio Portugal, Lisbon	6060	9600	9635	9680
			9705			
0230-0300		Radio Sweden, Stockholm	9695			
0230-0300		Radio Tirana, Albania	7065	9760		
0230-0300	S,M	WINB, Red Lion, Pennsylvania	15145			
0240-0250		All India Radio, New Delhi	3905	4860	4880	4895
			5960	5990	6110	6120
			7195	7295	9550	9610
			11830	11870	15305	
0250-0300		Radio Yerevan, Armenian SSR	11790	13645	15180	

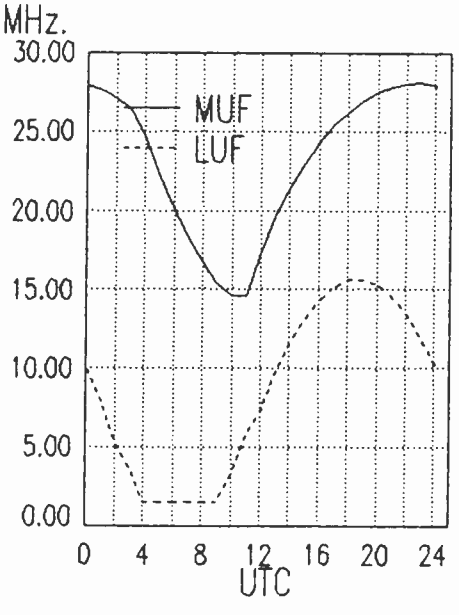
0300 UTC [11:00 PM EDT/8:00 PM PDT]

0300-0307		Radio Pakistan, Islamabad	5090	5930	7095	
0300-0310		CBC Northern Quebec Service	6195	9625		
0300-0325		Radio Netherland, Hilversum	6020	6165	9590	9895
0300-0330		BBC, London, England	3955	5975	6005	6155
			6175	6195	7325	9410
			9515	9660	9915	12095
0300-0330		Radio Budapest, Hungary	6110	9520	9585	9835
			11910	15160		
0300-0330		Radio Cairo, Egypt	9475	9675		
0300-0330		Radio Japan, Tokyo	11870	15195	17810	17825
			21610			
0300-0330	S,M	WINB, Red Lion, Pennsylvania	15145			
0300-0345	A	Radio New Zealand, Wellington	15150	17705		
0300-0350		Deutsche Welle, West Germany	6010	6120	9545	9605
			9700	11785		
0300-0350		Voice of Turkey, Ankara	9445			
0300-0355		Radio Beijing, PR China	9770	11715	15455	
0300-0355		Radio Polonia, Warsaw, Poland	6095	6135	7145	7270
			9525	11815	15120	
0300-0356		Radio RSA, South Africa	6010	9580	9615	
0300-0400		(US) Armed Forces Radio and TV	6030	11730	11790	
0300-0400		CBN, St. John's, Newfoundland	6160			
0300-0400		CBU, Vancouver, British Colombia	6160			
0300-0400		CFCF, Montreal, Quebec	6005			
0300-0400		CFCN, Calgary, Alberta	6030			
0300-0400		CHNS, Halifax, Nova Scotia	6130			
0300-0400		CKWX, Vancouver, British Colombia	6080			
0300-0400		CFRB, Toronto, Ontario	6070			
0300-0400		(US) Far East Network, Tokyo	3910			
0300-0400		HCJB, Quito, Ecuador	9720	11775	15155	
0300-0400	T-A	KVOH, Rancho Simi, California	9495			
0300-0400		La Voz Evangelica, Honduras	4820			
0300-0400		Radio Australia, Melbourne	11945	15160	15240	15320
			15395	17750	17715	17795
0300-0400		Radio for Peace, Costa Rica	7375			
0300-0400		Radio Havana Cuba	9655	6140	9770	
0300-0400		Radio Moscow, USSR	9600	9640	9765	11710
			12070	13605	13645	13665
			15425	15455	17570	17675
			17685	17740	17850	17860
			17880			
0300-0400		Radio Prague, Czechoslovakia	5930	6055	7345	9540
			9630	9740	11990	
0300-0400		Radio Sofia, Bulgaria	9560	9595	11735	11750
0300-0400		Radio Thailand, Bangkok	9655	11905		
0300-0400		SBC Radio One, Singapore	5010	5052	11940	
0300-0400		SLBC, Colombo, Sri Lanka	6005	9720	15425	
0300-0400	T-S	Superpower KUSW, Utah	9815			
0300-0400		Trans World Radio, Bonaire	9535			
0300-0400		Voice of America, Washington	6035	7170	7200	7280
			9525	9550	9575	9740
			11835			
0300-0400		Voice of Free China, Taiwan	5985	9680	11745	
0300-0400		Voice of Kenya, Nairobi	6045			
0300-0400		Voice of Nicaragua, Managua	6100			
0300-0400		WCSN, Boston, Massachusetts	9852.5			
0300-0400		WHRI, Noblesville, Indiana	7355	7400		
0300-0400		WRNO, New Orleans, Louisiana	6185			
0300-0400		WYFR, Oakland, California	5950	9520	15566	
0310-0330		Vatican Radio, Vatican City	6150			
0313-0400		Radio France Int'l, Paris	3965	7135	7175	
			9550	9790	9800	11670
			11700	11995		

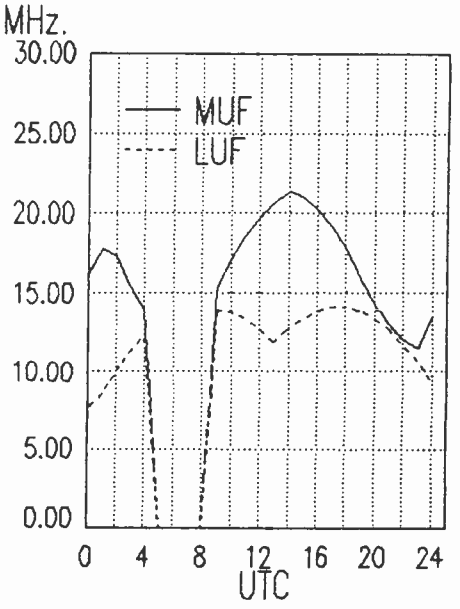
East Coast To
South America



East Coast To
West Coast



East Coast To
Central Asia



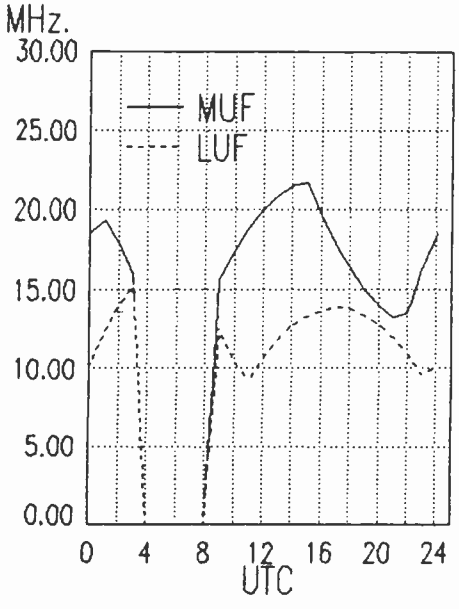
frequency SECTION

0330-0340	S-F	Port Moresby, Papua New Guinea	3925	4890	5960	5985
			6020	6040	6080	6140
			9520			
0330-0400		BBC, London, England	3955	5975	6005	6155
			6175	6195		
			9410	9660	9915	12095
0335-0400		Radio New Zealand, Wellington	11790	15150		
0330-0400		Radio Tanzania, Dar es Salaam	9684			
0330-0400		Radio Tirana, Albania	7065	9500		
0330-0400		Radio Sweden, Stockholm	11705			
0330-0400		United Arab Emirates Radio	9640	11940	15435	17890
0335-0340		All India Radio, New Delhi	3905	4860	9610	11830
			11870	11890	15305	
0340-0350	T-S	Voice of Greece, Athens	7430	9395	9420	
0345-0400		Radio Berlin Int'l, East Germany	9620	11785		
0350-0400		RAI, Rome, Italy	9710	11905	15330	

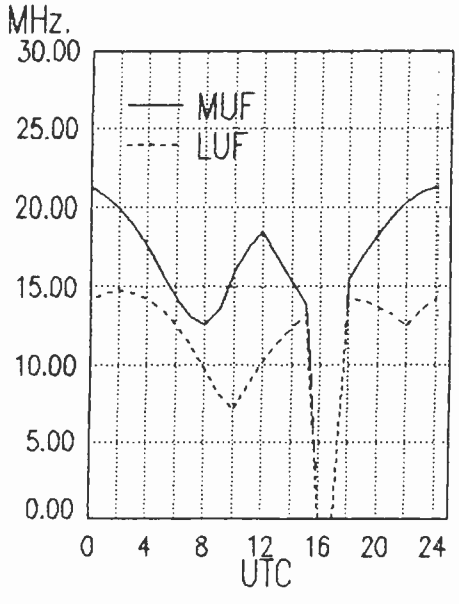
0400 UTC [12:00 AM EDT/9:00 PM PDT]

0400-0405		Radio Uganda, Kampala	4976	5026		
0400-0410		Radio Thailand, Bangkok	9655	11905		
0400-0410		RAI, Rome, Italy	9710	11905	15330	
0400-0415		Kol Israel, Jerusalem	9010	9435	12080	
0400-0420		Radio Botswana, Gabarone	4820			
0400-0420	T-S	Radio Zambia, Lusaka	3345	6165		
0400-0425		Radio Bucharest, Romania	6155	9510	9570	11830
			11940			
0400-0425		Radio Netherland, Hilversum	7210	9850		
0400-0426		Radio RSA, South Africa	7270	9580		
0400-0430		BBC, London, England	3955	5950	5975	6005
			6155	6195	7120	7160
			7185	9410	9580	9915
			12095			
0400-0430		La Voz Evangelica, Honduras	4820			
0400-0430		Radio Berlin Int'l, East Germany	5965	9620	11785	
0400-0430	M	Radio Norway Int'l, Oslo	9650	11760		
0400-0430		SLBC, Colombo, Sri Lanka	6005	9720	15425	
0400-0430		Radio Tanzania, Dar es Salaam	9684			
0400-0430		Swiss Radio Int'l, Berne	6135	9725	9885	12035
0400-0430		Trans World Radio, Bonaire	9535			
0400-0450		Radio Pyongyang, North Korea	15160	15180		
0400-0455		Radio Beijing, PR China	9645	11980		
0400-0455		RAE, Buenos Aires, Argentina	9690	11710		
0400-0500		(US) Armed Forces Radio and TV	6030	11730	11790	
0400-0500		CBC Northern Quebec Service	6195	9625		
0400-0500		CBN, St. John's, Newfoundland	6160			
0400-0500		CBU, Vancouver, British Colombia	6160			
0400-0500		CFCF, Montreal, Quebec	6005			
0400-0500		CFCN, Calgary, Alberta	6030			
0400-0500		CHNS, Halifax, Nova Scotia	6130			
0400-0500		CKWX, Vancouver, British Colombia	6080			
0400-0500		CFRB, Toronto, Ontario	6070			
0400-0500		(US) Far East Network, Tokyo	3910			
0400-0500		FEBC, Manila, Philippines	11850			
0400-0500		HCJB, Quito, Ecuador	9720	11775	15155	
0400-0500		KYOI, Saipan	17780			
0400-0500		Radio Australia, Melbourne	11910	11945	15160	15240
			15320	17715	17795	
0400-0500		Radio Havana Cuba	5965	6035	6140	9655
			9770			
0400-0500		Radio Moscow, USSR	7185	9600	9610	9640
			9765	11790	12050	13605
			13645	13665	13675	15180
			15320	15425	17570	17600
			17685	17740	17850	17860
			17880			
0400-0500		Radio New Zealand, Wellington	11780	15150		
0400-0500		SBC Radio One, Singapore	5010	5052	11940	
0400-0500	T-S	Superpower KUSW, Utah	9815			
0400-0500		Voice of America, Washington	5995	6035	7170	7200
			7280	9525	9575	11835
			11925			
0400-0500		Voice of Kenya, Nairobi	6045			
0400-0500		WCSN, Boston, Massachusetts	9870			
0400-0500		WINB, Red Lion, Pennsylvania	15145			
0400-0500		WHRI, Noblesville, Indiana	7365	7400		
0400-0500	M-A	WMLK, Bethel, Pennsylvania	9455			

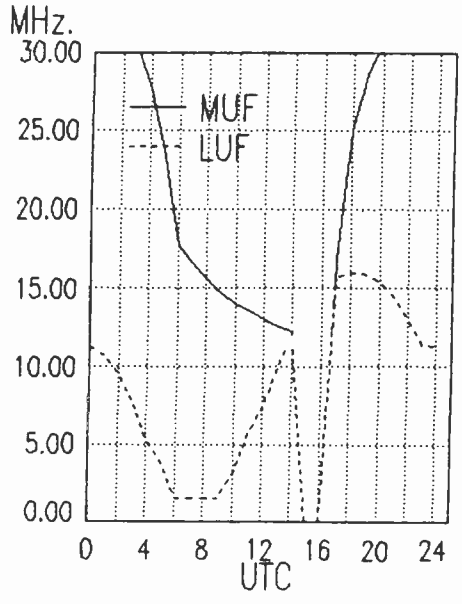
East Coast To
Southeast Asia



East Coast To
Far East



East Coast To
Pacific

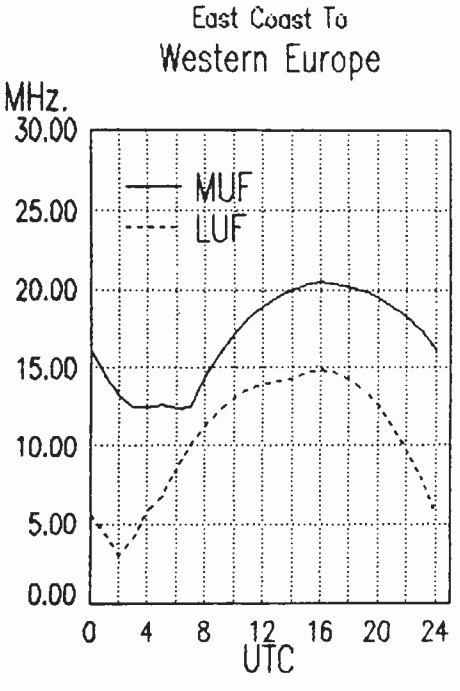


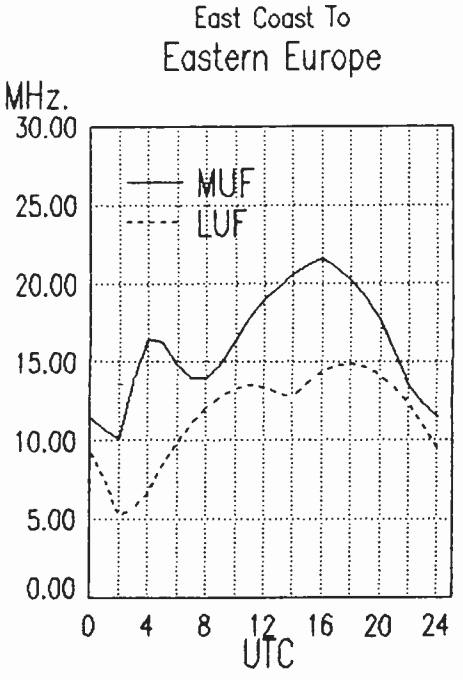
frequency SECTION

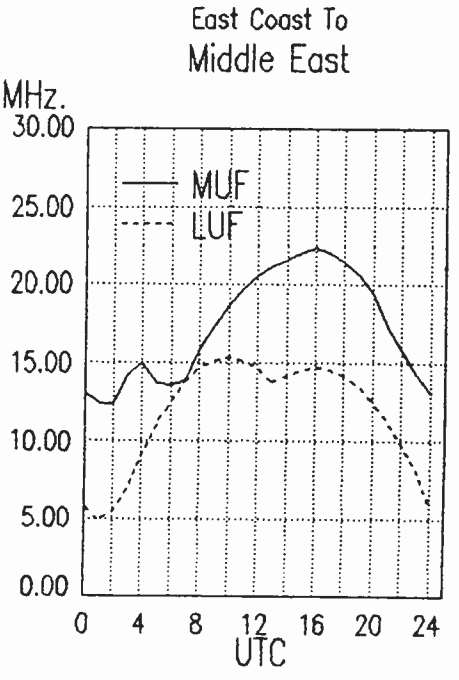
0400-0500		WRNO, New Orleans, Louisiana	6185			
0400-0500		WYFR, Satellite Net, California	9520			
0425-0440		RAI, Rome, Italy	5980	7275		
0430-0455		Radio Austria Int'l, Vienna	6155	9875	15410	
0430-0500		BBC, London, England	5975	6005	6155	6195
			7120	7185	7210	9410
			9510	9580	9750	11945
			12095			
0430-0500		Deutsche Welle, West Germany	7150	7225	9565	9765
			11765			
0430-0500		Radio Finland, Helsinki	6120	9670	11715	15185
0430-0500		Radio Tirana, Albania	9480	11835		
0430-0500	S,M	Trans World Radio, Bonaire	9535			
0430-0500		Trans World Radio, Swaziland	3205	7205		
0430-0500		Voice of Nigeria, Lagos	7255			

0500 UTC [1:00 AM EDT/10:00 PM PDT]

0500-0510		CBC Northern Quebec Service	6195	9625		
0500-0510		Radio Lesotho, Maseru	4800			
0500-0510	M-A	Radio Zambia, Lusaka	3345	6165		
0500-0515		Deutsche Welle, West Germany	7150	7225	9565	9765
			11765			
0500-0515		GBC, Accra, Ghana	4915			
0500-0515		Vatican Radio, Vatican City	9645	11725	15190	
0500-0530	M	Radio Norway Int'l, Oslo	11735	15310		
0500-0530	S,M	Trans World Radio, Bonaire	9535			
0500-0530		Trans World Radio, Swaziland	3205	5055	7210	
0500-0550		Deutsche Welle, West Germany	6045	6120	9635	9700
0500-0555		Radio Beijing, China	9690			
0500-0600		(US) Armed Forces Radio and TV	6030	11730	11790	
0500-0600		BBC, London, England	3955	5975	6005	6195
			7105	7160	7185	9410
			9510	9580	12095	
0500-0600		CBC Northern Quebec Service	6195	9625		
0500-0600		CBU, Vancouver, British Colombia	6160			
0500-0600		CFCF, Montreal, Quebec	6005			
0500-0600		CFCN, Calgary, Alberta	6030			
0500-0600		CHNS, Halifax, Nova Scotia	6130			
0500-0600		CKWX, Vancouver, British Colombia	6080			
0500-0600		CFRB, Toronto, Ontario	6070			
0500-0600		(US) Far East Network, Tokyo	3910			
0500-0600		FEBC, Manila, Philippines	11850			
0500-0600		HCJB, Quito, Ecuador	6230	9720	11775	
0500-0600		Radio Australia, Melbourne	11910	15160	15240	15395
			17715	17750,	17795	
0500-0600		Radio Havana Cuba	5965	6035	9655	9770
0500-0600		Radio Japan, Tokyo	11870	17810		
0500-0600		Radio Kuwait	15345			
0500-0600		Radio Moscow, USSR	9635	9765	12030	12050
			12070	13605	13645	15180
			15455	17570	17600	17625
			17665	17675	17685	17850
			17860	17880		
0500-0600		Radio New Zealand, Wellington	11780	15150		
0500-0600		Radio Thailand, Bangkok	9655	11905		
0500-0600	S	Radio Zambia, Lusaka	11880			
0500-0600		SBC Radio One, Singapore	5010	5052	11940	
0500-0600		Spanish Foreign Radio, Madrid	6125			
0500-0600	S	Superpower KUSW, Utah	6155			
0500-0600	S	Swaziland Commercial Radio	6155	9705		
0500-0600		Voice of America, Washington	3990	5995	6035	7200
			7170	7280	9575	9670
			9740	11835	11925	
0500-0600		Voice of Kenya, Nairobi	6045			
0500-0600		Voice of Nigeria, Lagos	7255	15120	15185	
0500-0600		WCSN, Boston, Massachusetts	9870			
0500-0600		WHRI, Noblesville, Indiana	7365	7400		
0500-0600	M-A	WMLK, Bethel, Pennsylvania	9455			
0500-0600		WRNO, New Orleans, Louisiana	6185			
0500-0600		WYFR, Oakland, California	9705	11580		
0500-0600	T-S	WYFR Satellite Net, California	9520			
0510-0520		Radio Botswana, Gaborone	3356	4820	7255	
0515-0530	M-F	Radio Canada Int'l, Montreal	15245			
0530-0545		BBC, London, England*	3990	6050	6140	7210
			9750			
0530-0555		Radio Bucharest, Romania	9640	11840	11940	15340





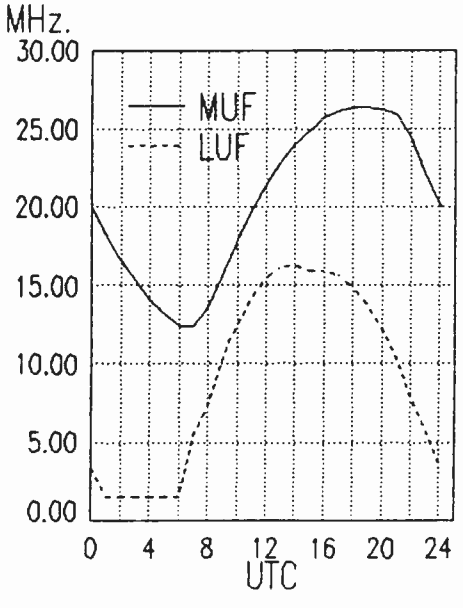


			15380	17720		
0530-0600		Radio Netherland, Hilversum	6165	9715		
0530-0600		Radio Tirana, Albania	7300			
0530-0600		Trans World Radio, Swaziland	5055	7210		
0530-0600		UAE RAdio, United Arab Emirates	15435	17775	21700	
0545-0600		Radio Berlin Int'l, East Germany	15240	17880	21540	21645
0545-0600	M-F	Radio Canada Intl, Montreal	15245			
0555-0600		Ghana Broadcasting Corp., Accra	4915			
0555-0600		Voice of Malaysia, Kuala Lumpur	6175	9750	15295	

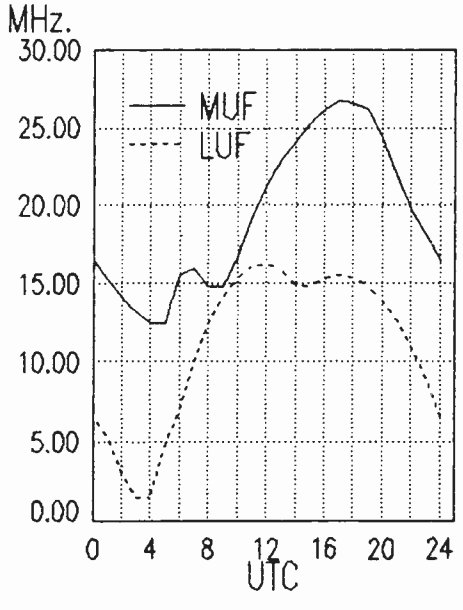
0600 UTC [2:00 AM EDT/11:00 PM PDT]

0600-0615		Radio Ghana, Accra	3366	4915		
0600-0615	M-A	Radio Zambia, Lusaka	6165	7235		
0600-0620		Vatican Radio, Vatican City	6185	9645		
0600-0625		Radio Netherlands, Hilversum	6165	9715		
0600-0630		Laotian National Radio	7113			
0600-0630		Radio Australia, Melbourne	11910	11945	15160	15240
			15315	15395	17715	17750
			17795			
0600-0630		Radio Berlin Int'l, East Germany	15240	17880	21540	21645
0600-0630		Trans World Radio, Swaziland	5055	6070	7210	
0600-0630		Voice of Kenya, Nairobi	6045			
0600-0645		HCJB, Quito, Ecuador	6230	9720	11775	
0600-0645		Radio Berlin Int'l, East Germany	5965	11810		
0600-0645	S	Radio Cameroon, Yaounde	4850			
0600-0650		Radio Pyongyang, North Korea	9530	15160	15180	
0600-0700		(US) Armed Forces Radio and TV	6030	11730	11790	
0600-0700		BBC, London, England	3955	5975	6195	7105
			9600	9640	12095	15280
0600-0700		CBC Northern Quebec Service	6195			
0600-0700		CBU, Vancouver, British Colombia	6160			
0600-0700		CFCF, Montreal, Quebec	6005			
0600-0700		CFCN, Calgary, Alberta	6030			
0600-0700		CHNS, Halifax, Nova Scotia	6130			
0600-0700		CKWX, Vancouver, British Colombia	6080			
0600-0700		CFRB, Toronto, Ontario	6070			
0600-0700		(US) Far East Network, Tokyo	3910			
0600-0700	F	FEBA, Mahe, Seychelles	17855			
0600-0700		King of Hope, South Lebanon	6215			
0600-0700		KYOI, Saipan	17780			
0600-0700		Radio Havana Cuba	9525			
0600-0700		Radio Korea, Seoul, South Korea	6060	7275	9570	
0600-0700		Radio Kuwait	15345			
0600-0700		Radio Moscow, USSR	12030	13605	13645	15150
			15180	17570	17625	17675
			17685	17850	17860	17880
0600-0700		Radio New Zealand, Wellington	11780	15150		
0600-0700	A,S	Radio Thailand, Bangkok	9655	11905		
0600-0700	S	Radio Zambia, Lusaka	11880			
0600-0700		SBC Radio One, Singapore	5010	5052	11940	
0600-0700	S	Superpower KUSW, Utah	6155			
0600-0700		Trans World Radio Monte Carlo	7105			
0600-0700		Voice of America, Washington	5995	6035	6080	6095
			6125	7280	7325	9530
			9540	9550	11915	
0600-0700		Voice of Asia, Taiwan	7285			
0600-0700		Voice of Malaysia, Kuala Lumpur	6175	9750	15295	
0600-0700		Voice of Nigaria, Lagos	15185			
0600-0700		WCSN, Boston, Massachusetts	9495			
0600-0700		WHRI, Noblesville, Indiana	7365	7400		
0600-0700	M-A	WMLK, Bethel, Pennsyvlania	9455			
0600-0700		WYFR, Oakland, California	5950	6065	7355	9520
			9852.5	15257		
0615-0630		Radio Korea, Seoul, South Korea	13670			
0615-0630	M-A	Vatican Radio, Vatican City	15190	17730		
0615-0700		Deutsche Welle, West Germany	9610	9700	11765	15185
0630-0700	A	CPBS-1, China*	11330	15550	15590	17605
0630-0655		Radio Austria Int'l, Vienna	6000	6155	15410	
0630-0655		Radio Netherland, Hilversum	9895	11930		
0630-0700		Radio Australia, Melbourne	11945	15160	15240	15315
			15395	15425	17715	17750
			17795			
0630-0700		Radio Bucharest, Romania	21600			
0630-0700		Radio Finland, Helsinki	6120	9560	11755	15270
0630-0700		Radio Polonia, Warsaw, Poland	6135	7270	15120	
0630-0700		Radio Tirana, Albania	7205	9500		
0630-0700		Swiss Radio Int'l, Berne	3985	6165	9535	12030

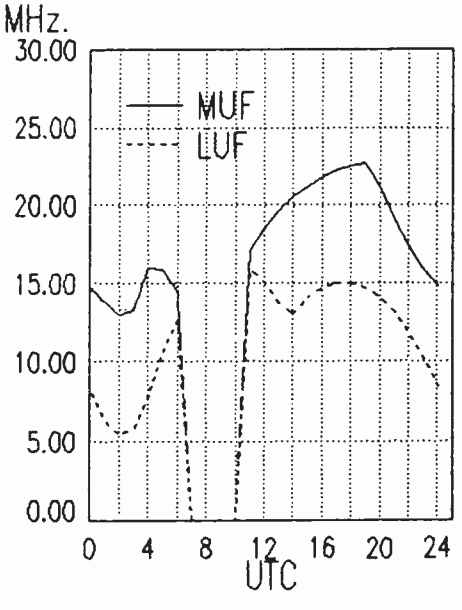
East Coast To
West Africa



Midwest To
Central Africa



Midwest To
East Africa

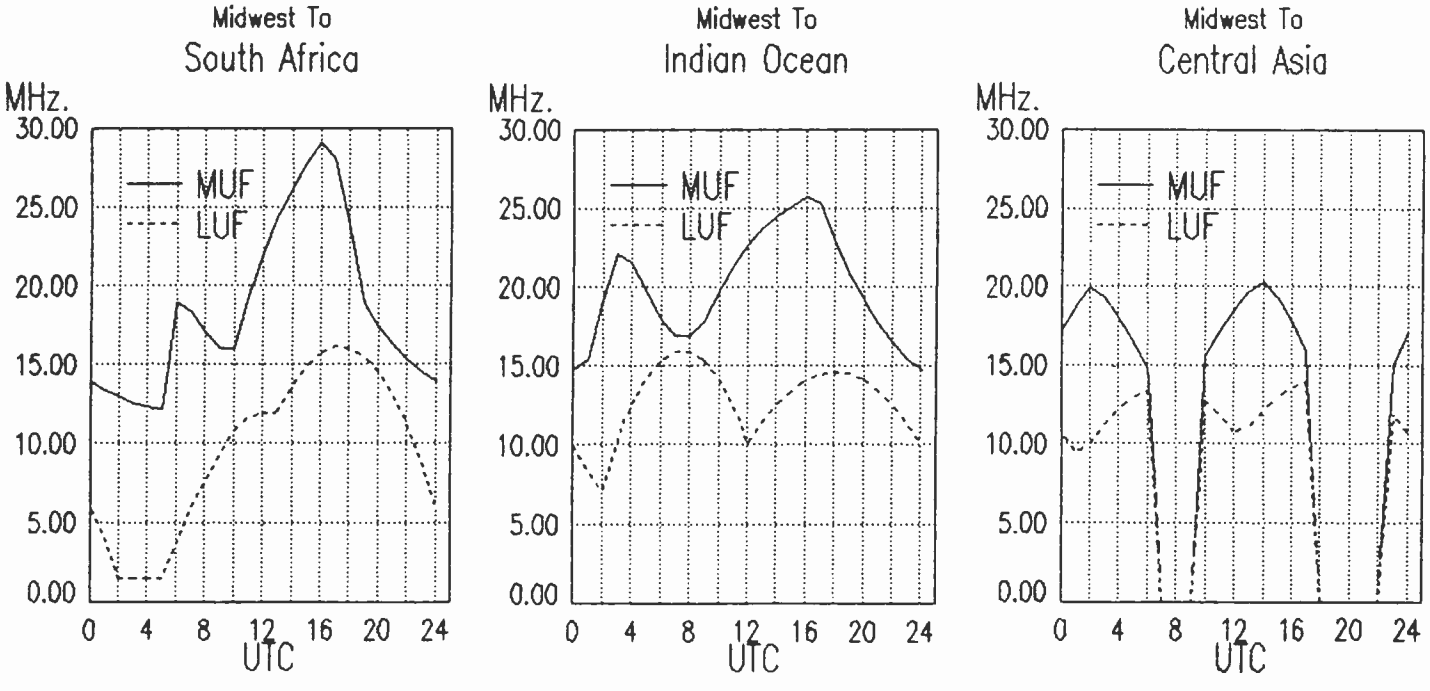


frequency SECTION

			15430	17570		
0630-0700		Trans World Radio, Swaziland	5055	6070	7210	9725
0630-0700	A,S	Voice of Kenya, Nairobi	7270			
0645-0700		BBC, London, England*	6150	7260	11945	
0645-0700		HCJB, Quito, Ecuador	6130	6230	9720	11775
0645-0700		Radio Bucharest, Romania	11940	15250	15335	17790
			17805	21665		
0645-0700	M-F	Radio Canada Int'l, Montreal	6050	6140	7155	9740
			9760	11840	15235	
0645-0700		Radio Ghana, Accra	6130			
			11705	11800		

0700 UTC [3:00 AM EDT/12:00 AM PDT]

0700-0703		Port Moresby, Papua New Guinea	3925	4890	5960	5985
			6020	6040	6080	6140
			9520			
0700-0710		Radio Bucharest, Romania	11940	15250	15335	17790
			17805	21665		
0700-0710		Radio Sierra Leone, Freetown	5980			
0700-0715		Radio Ghana (HS), Accra	3366	4915		
0700-0730		BBC, London, England	5975	6195	7150	9410
			9600	9640	11860	12095
			15280			
0700-0730		Burma Bcasting Service, Rangoon	9730			
0700-0730		Radio Australia, Melbourne	5995	9655	9845	15160
			15240	15395	17715	17750
0700-0730		Radio Bucharest, Romania	21600			
0700-0730		Radio New Zealand, Wellington	12045	15150		
0700-0730	S	Radio Zambia, Lusaka	11880			
0700-0745		WYFR, Oakland, California	6065	7355	9852.5	
0700-0750		Radio Pyongyang, North Korea	15340	17795		
0700-0800		AWR, Forli, Italy	7257			
0700-0800		CBU, Vancouver, British Colombia	6130			
0700-0800		CFCF, Montreal, Quebec	6005			
0700-0800		CFCN, Calgary, Alberta	6030			
0700-0800		CHNS, Halifax, Nova Scotia	6130			
0700-0800		CKWX, Vancouver, British Columbia	6080			
0700-0800		CFRB, Toronto, Ontario	6070			
0700-0800		ELWA, Monrovia, Liberia	11830			
0700-0800		(US) Far East Network, Tokyo	3910			
0700-0800		HCJB, Quito, Ecuador	6130	9610	9745	11835
			11925			
0700-0800		King of Hope, South Lebanon	6215			
0700-0800		KYOI, Saipan	17780			
0700-0800		Radio Ghana, Accra	6130			
0700-0800		Radio Havana Cuba	9525			
0700-0800		Radio Japan, Tokyo	5990	15195	15235	17810
			21695			
0700-0800		Radio Kuwait	15345			
0700-0800		Radio Moscow, USSR	13605	15150	17675	17685
			17850	17880		
0700-0800	A,S	Radio Thailand, Bangkok	9655	11905		
0700-0800		SBC-1, Singapore	11940			
0700-0800	S	Superpower KUSW, Utah	6135			
0700-0800		Trans World Radio, Swaziland	6070	9725		
0700-0800		Voice of Free China, Taiwan	5985			
0700-0800	A,S	Voice of Kenya, Nairobi	7270			
0700-0800		Voice of Malaysia, Kuala Lumpur	6175	9750	15295	
0700-0800		Voice of Nigeria, Lagos	15120	15185		
0700-0800		WCSN, Boston, Massachusetts	9495			
0700-0800		WHRI, Noblesville, Indiana	7365	7400		
0700-0800		WYFR, Oakland, California	6065	7365	9620	
0715-0800	A,S	Radio Berlin Int'l, East Germany	6040	7185	9730	21465
			21540			
0715-0730	M-A	Vatican Radio, Vatican City	11725	15190		
0715-0735	S	FEBA, Mahe, Seychelles	15115	17785		
0720-0730	M-A	Vatican Radio, Vatican City	6248	9645	11740	
0725-0800		Trans World Radio, Monte Carlo	7105			
0730-0800		ABC, Alice Springs, Australia	2310	[ML]		
0730-0800		ABC, Katherine, Australia	2485			
0730-0800		ABC, Tennant Creek, Australia	2325	[ML]		
0730-0800		Radio Australia, Melbourne	9655	11720		
0730-0735		All India Radio, New Delhi	5990	6010	6020	7110
			7205	9610	9675	11850
			11935	15235	15250	17705
0730-0745		BBC, London, England*	3975	6010	7230	9915
0730-0755		Radio Finland, Helsinki	6120	9560	11755	

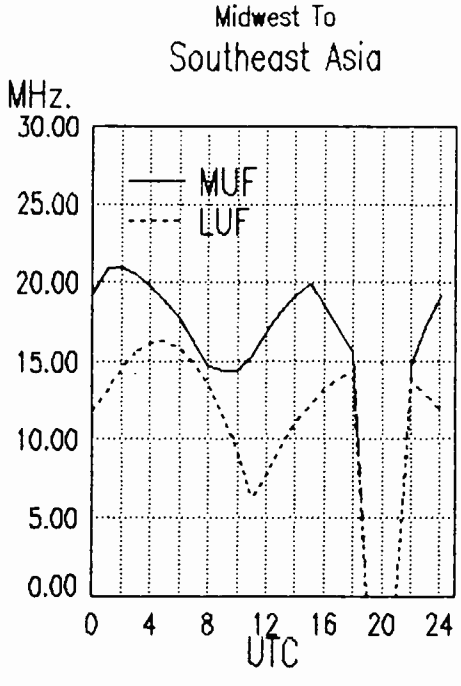


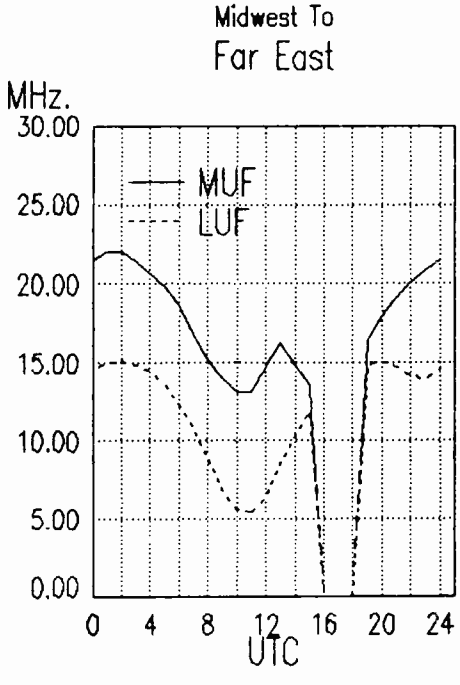
frequency SECTION

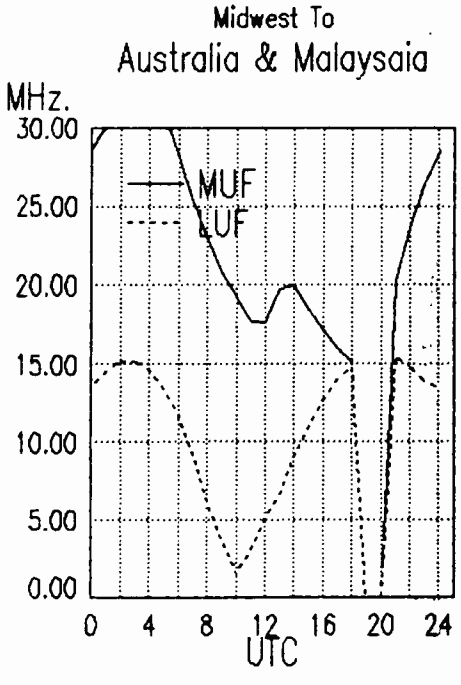
0730-0800		BBC, London, England	5975	9640			
0730-0800		Radio Netherland, Hilversum	9630	9715			
0730-0800		Radio Prague, Czechoslovakia	11685	17840	21705		
0730-0800		Radio Sofia, Bulgaria	9700	11720			
0730-0800		Soloman Islands Broadcasting Corp	9545				
0730-0800		Swiss Radio Int'l, Berne	3985	6165	9535		
0740-0750	W	Radio Free Europe, Munich*	5985	7115	9695	9725	
			11895	15355			
0745-0800		Radio Prague, Czechoslovakia	6055	7345	9505		

0800 UTC [4:00 AM EDT/1:00 AM PDT]

0800-0805	M-F	Port Moresby, Papua New Guinea	3925	4890	5960	5985	
			6020	6040	6080	6140	
			9520				
0800-0805		Soloman Islands Broadcasting Corp	9545				
0800-0815	M-A	Radio Zambia, Lusaka	6165	7235			
0800-0825	M-F	BRT, Brussels, Belgium	11695	15510			
0800-0825		Radio Netherland, Hilversum	9630	9715			
0800-0825		Voice of Malaysia, Kuala Lumpur	6175	9750	15295		
0800-0830		HCJB, Quito, Ecuador	6130	9610	9745	11835	
			11925				
0800-0830		Radio Bangladesh, Dhaka	12030	15525			
0800-0830		Radio Tirana, Albania	9500	11835			
0800-0830		Voice of Islam, Pakistan	15525	17870			
0800-0835	S	FEBA, Mahe, Seychelles	15325,	17785			
0800-0835		Trans World Radio, Swaziland	6070	9725			
0800-0850		Radio Pyongyang, North Korea	9530	11830	15160	15180	
0800-0900		ABC, Alice Springs, Australia	2310	[ML]			
0800-0900		ABC, Katherine, Australia	2485				
0800-0900		ABC, Tennant Creek, Australia	2325	[ML]			
0800-0900		BBC, London, England	9410	9640	11860	12095	
			15070	15360	15400		
0800-0900		CBN, St. John's, Newfoundland	6160				
0800-0900		CBU, Vancouver, British Colombia	6160				
0800-0900		CFCF, Montreal, Quebec	6005				
0800-0900		CFCN, Calgary, Alberta	6030				
0800-0900		CHNS, Halifax, Nova Scotia	6130				
0800-0900		CKWX, Vancouver, British Colombia	6080				
0800-0900		CFRB, Toronto, Ontario	6070				
0800-0900		(US) Far East Network, Tokyo	3910				
0800-0900		King of Hope, South Lebanon	6215				
0800-0900		KNLS, Anchor Point, Alaska	6150				
0800-0900		KTWR, Guam	11805				
0800-0900		KYOI, Saipan	11900				
0800-0900		Radio Australia, Melbourne	5995	6080	9580	9655	
			9710	11720			
0800-0900		Radio Korea, Seoul, South Korea	7550				
0800-0900		Radio Moscow, USSR	12055	15295			
0800-0900		SBC Radio One, Singapore	5010	5052	11940		
0800-0900	S	Superpower KUSW, Utah	6135				
0800-0900		Trans World Radio, Monte Carlo	7105				
0800-0900		Voice of Indonesia, Jakarta	11790	15105			
0800-0900	A,S	Voice of Kenya, Nairobi	7270				
0800-0900		Voice of Nigaria, Lagos	7255	15185			
0800-0900		WHRI, Noblesville, Indiana	7355	9510			
0800-0900		WYFR, Oakland, California	11580	15495			
0815-0830	S	Radio Austria Int'l, Vienna	6155	11915	15410	15415	
			17870				
0815-0830		Radio Korea, Seoul, South Korea	9570				
0815-0845	M-F	Voice of America, Washington DC	7175	9575	9750	11710	
			11915	15600	17715	21500	
			[ML]				
0830-0840		All India Radio, New Delhi	5960	5990	6010	6020	
			6050	6065	6100	6140	
			7110	7140	7160	7250	
			7280	7295	9610	11850	
			15235	15250	17705		
0830-0855		Radio Austria Int'l, Vienna	6155	11915	15410	15415	
0830-0855	M-A	Radio Netherland, Hilversum	9630				
0830-0900	S	Bhutan Bcasting Service, Thimpu	6035				
0830-0900		FEBC, Manila, Philippines	11850	15350			
0830-0900		HCJB, Quito, Ecuador	6130	9745	11925		
0830-0900		Radio Beijing, China	9700	11755	15440		
0830-0900		Radio Finland, Helsinki	15245	17795			
0830-0900		Radio Netherland, Hilversum	9630	21486			
0830-0900		Radio Prague, Czechoslovakia	11685	17840	21705		
0830-0900		Swiss Radio Int'l, Berne	9560	9885	13685	17830	
			21695				





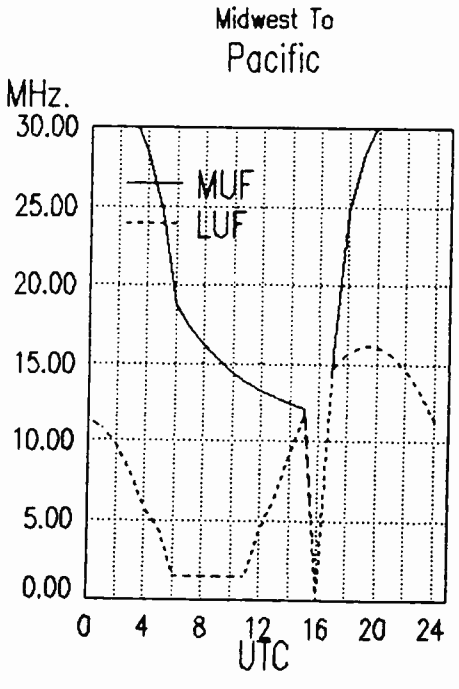


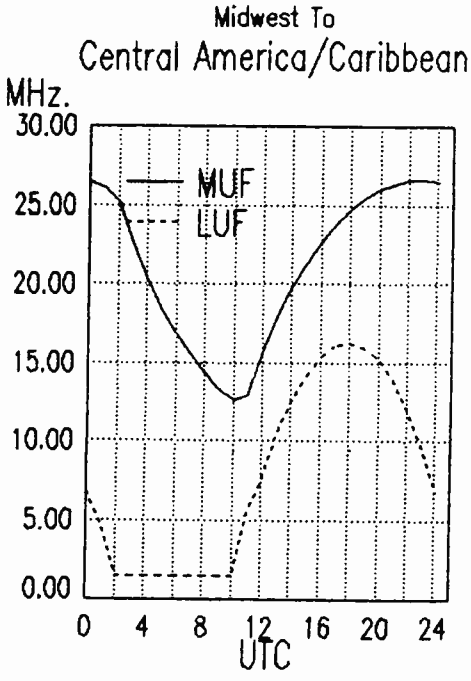
frequency SECTION

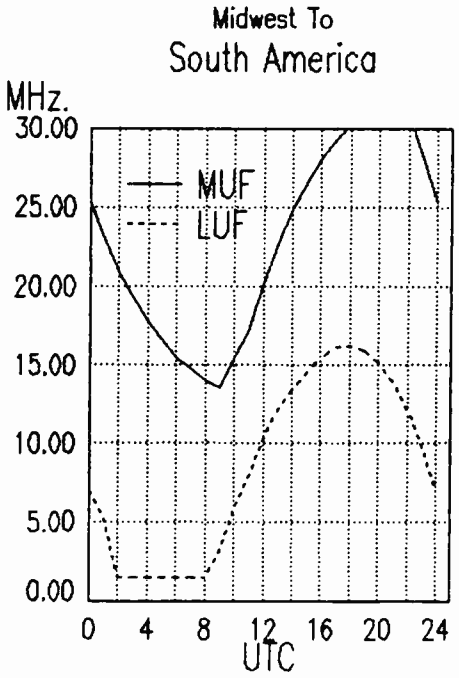
0830-0900		Voice of Nigeria, Lagos	15120			
0840-0850	M-A	Voice of Greece, Athens	9855	15630		
0845-0900		Radio Berlin Int'l, East Germany	21540			
0845-0900		Radio Prague, Czechoslovakia	6055	7345	9505	
0850-0900		All India Radio, New Delhi	5960	5990	6010	6020
			6050	6065	6100	6140
			7110	7140	7150	7160
			7250	7280	7295	9610
			11850	15235	15250	17705

0900 UTC [5:00 AM EDT/2:00 AM PDT]

0900-0905		Africa No. 1, Gabon	7200	15200		
0900-0910		All India Radio, New Delhi	5960	5990	6010	6020
			6050	6065	6100	6140
			7110	7140	7150	7160
			7250	7280	7295	9610
			11850	15235	15250	17705
0900-0910		Port Moresby, Papua New Guinea	3295	4890	5960	5985
			6020	6040	6080	6140
			9520			
0900-0910		Voice of Lebanon, Beirut	6548			
0900-0925	M-F	BRT, Brussels, Belgium	17595	21810		
0900-0930		FEBC, Manila, Philippines	11850	15350		
0900-0930		KTWR, Agana, Guam	11805			
0900-0930		Nippon Broadcasting Corp.	3925			
0900-0930		Radio Beijing, China	9700	11755	15440	
0900-0930		Radio Berlin Int'l, East Germany	21540			
0900-0930		Radio Netherland, Hilversum	21485			
0900-0930	A,S	Radio Prague, Czechoslavkia	11685	17840	21705	
0900-0950		Deutsche Welle, West Germany	9720	15510	17780	21650
			21680			
0900-1000		ABC, Alice Springs, Australia	2310	[ML]		
0900-1000		ABC, Katherine, Australia	2485			
0900-1000		ABC, Tennant Creek, Australia	2325	[ML]		
0900-1000	S	Adventist World Radio, Portugal	9670			
0900-1000		(US) Armed Forces Radio and TV	6030	9530	9565	
0900-1000		BBC, London, England	9740	11750	11860	11955
			12095	15400	15360	17790
0900-1000		CFCF, Montreal, Quebec	6005			
0900-1000		CFCN, Calgary, Alberta	6030			
0900-1000		CHNS, Halifax, Nova Scotia	6130			
0900-1000		CKWX, Vancouver, British Colombia	6080			
0900-1000		CFRB, Toronto, Ontario	6070			
0900-1000		(US) Far East Network, Tokyo	3910			
0900-1000		HCJB, Quito, Ecuador	6130	9745	11925	
0900-1000		King of Hope, South Lebanon	6215			
0900-1000		KNLS, Anchor Point, Alaska	6150			
0900-1000		KTWR, Guam	11805			
0900-1000	S	Superpower KUSW, Utah	6135			
0900-1000		Radio Afghanistan, Kabul	4450	6085	15435	17720
0900-1000		Radio Australia, Melbourne	5995	6080	9580	9655
			9710	9760	11720	15415
0900-1000		Radio Japan, Tokyo	11885			
0900-1000		Radio Moscow, USSR	5905	6020	6095	7345
			12055			
0900-1000	S	Radio Prague, Czechoslovakia	6055	7345	9505	[ML]
0900-1000		Radio Tanzania, Dar es Salaam	7165			
0900-1000		SBC Radio One, Singapore	5010	5052	11940	
0900-1000		Trans World Radio, Monte Carlo	7105			
0900-1000		Voice of Kenya, Nairobi	7270			
0900-1000		Voice of Nigeria, Lagos	7255	15120	15185	
0900-1000		WHRI, Noblesville, Indiana	7355	9510		
0915-0950	M-A	Radio Ulan Bator, Mongolia	9615	12015		
0930-0935		All India Radio, New Delhi	5960	5990	6010	6020
			6050	6065	6100	6140
			7110	7140	7160	7250
			7280	7295	9610	11850
			15235	15250	17705	
0930-0940	M-F	Radio Canada Int'l, Montreal	5960	9755		
0930-0945		BBC, London, England*	9725	11955		
0945-1000	S	Radio Budapest, Hungary	7220	9585	15160	15220
			17710	17780	21525	
0930-1000		CBN, St. John's, Newfoundland	6160			
0930-1000		KTWR, Agana, Guam	11805			
0930-1000		Radio Beijing, China	9700	11755	15440	
0930-1000		Radio Sweden Int'l, Stockholm	15390			
0945-1000		BBC, London, England*	5995	7180	9725	11955
0945-1000	S	Radio Budapest, Hungary	9585	9835	11910	15160







frequency SECTION

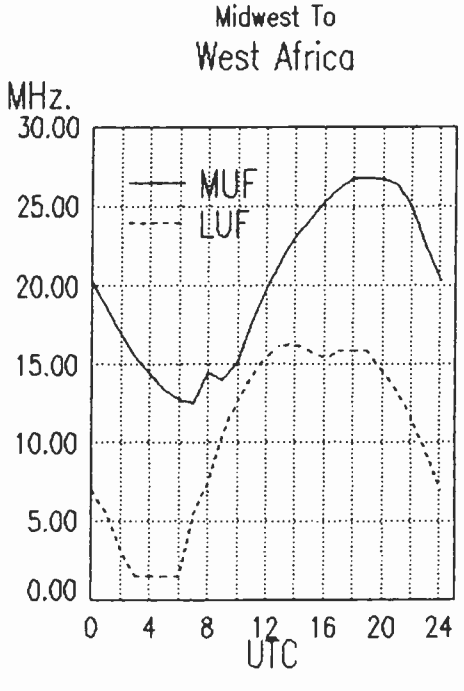
0945-1000	M-A	Radio Prague, Czechoslovakia	6055	7345	9505		

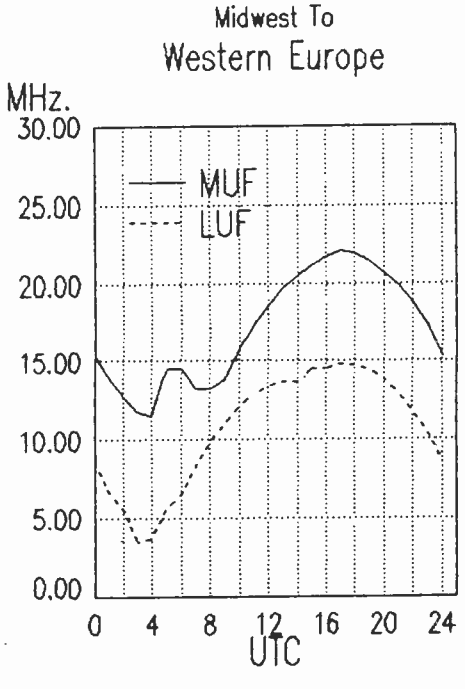
1000 UTC [6:00 AM EDT/3:00 AM PDT]

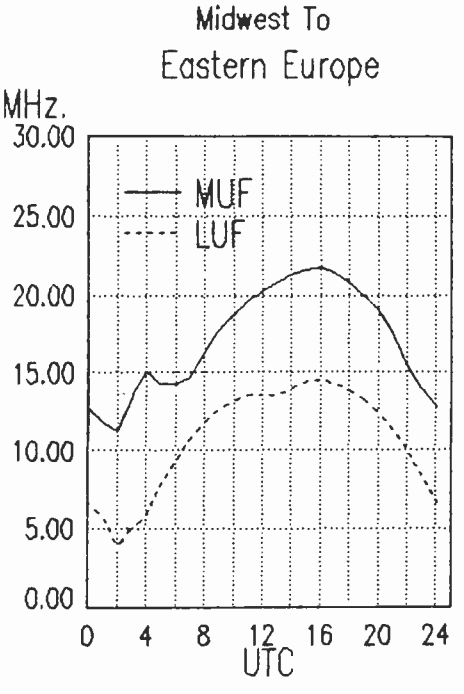
1000-1030		Deutsche Welle, West Germany	9735	11785	17765	21600	
1000-1030		HCJB, Quito, Ecuador	6130	9745	11925		
1000-1030		Kol Israel, Jerusalem	9385	11700	15485	15640	
			15650	17635	17685	21625	
1000-1030		Radio Afghanistan, Kabul	4450	6085	15435	17720	
1000-1030		Radio Beijing, China	9700	11755	15440		
1000-1030	S	Radio Norway Int'l, Oslo	9590	15180	15235	17780	
1000-1030		Radio Tanzania, Dar es Salaam	7165				
1000-1030		Swiss Radio Int'l, Berne	9560	9885	13685	17830	
			21695				
1000-1030		Voice of Ethiopia, Addis Ababa	9560				
1000-1030		Voice of Vietnam, Hanoi	9840	12020	15010		
1000-1055	A	Trans World Radio, Monte Carlo	7105				
1000-1100		ABC, Alice Springs, Australia	2310	[ML]			
1000-1100		ABC, Katherine, Australia	2485				
1000-1100		ABC, Tennant Creek, Australia	2325	[ML]			
1000-1100		(US) Armed Forces Radio and TV	6030	9565	9700		
1000-1100		All India Radio, New Delhi	11860	11915	15130	15335	
			17387	11785			
1000-1100		BBC, London, England	6195	9740	9790	11750	
			12095	15070	15400	18080	
1000-1100		CBN, St. John's, Newfoundland	6160				
1000-1100		CFCF, Montreal, Quebec	6005				
1000-1100		CFCN, Calgary, Alberta	6030				
1000-1100		CHNS, Halifax, Nova Scotia	6130				
1000-1100		CKWX, Vancouver, British Colombia	6080				
1000-1100		CFRB, Toronto, Ontario	6070				
1000-1100		(US) Far East Network, Tokyo	3910				
1000-1100		KNLS, Anchor Point, Alaska	6150				
1000-1100		KTWR, Agana, Guam	11805				
1000-1100		KYOI, Saipan	11900				
1000-1100		Radio Afghanistan, Kabul	15435	17720			
1000-1100		Radio Australia, Melbourne	9580	9655	9770	15415	
1000-1100		Radio Moscow, USSR	9600	12055	15150		
1000-1100		Radio New Zealand, Wellington	6100	9540			
1000-1100	S	Radio Prague, Czechoslovakia	6055	7345	9505	[ML]	
1000-1100		SBC Radio One, Singapore	5010	5052	11940		
1000-1100		Superpower KUSW, Utah	6135				
1000-1100		Voice of America, Washington	5975	5985	9590		
1000-1100		Voice of Kenya, Nairobi	7270				
1000-1100		Voice of Nigeria, Lagos	7255	15120			
1000-1100		WHRI, Noblesville, Indiana	7355	9510			
1000-1100		WYFR, Oakland, California	5985				
1005-1010		Radio Pakistan, Islamabad	15606	17660			
1015-1030		Radio Korea, Seoul, South Korea	11740				
1030-1040		Voice of Asia, Taiwan	5980				
1030-1055		Radio Austria Int'l, Vienna	17870				
1030-1100		HCJB, Quito, Ecuador	6130	11925			
1030-1045	A	Radio Budapest, Hungary	7220	9585	9835	15220	
1030-1100		Radio Netherlands, Hilversum	6020	9675			
1030-1100	A,S	Radio Tanzania, Dar es Salaam	7165				
1030-1100		SLBC, Colombo, Sri Lanka	11835	15120	17850	[ML]	
1030-1100		UAE Radio, United Arab Emirates	15435	17865	21605		
1040-1050	H	Radio Free Europe, Munich*	5985	7115	9695	9725	
			11895	15355			
1040-1050	M-A	Voice of Greece, Athens	11645	15630			
1045-1100	M-A	Radio Prague, Czechoslovakia	6055	7345	9505		
1055-1100	S	Trans World Radio, Monte Carlo	7105				

1100 UTC [7:00 AM EDT/4:00 AM PDT]

1100-1105		Radio Pakistan, Islamabad	6090	7290			
1100-1105	A	Port Moresby, Papua New Guinea	3295	4890	5960	5985	
			6020	6040	6080	6140	
			9520				
1100-1110	S	Port Moresby, Papua New Guinea	3295	4890	5960	5985	
			6020	6040	6080	6140	
			9520				
1100-1115		Radio New Zealand, Wellington	6100	9540			
1100-1120		Radio Pakistan, Islamabad	15606	17760			
1100-1125		Radio Netherland, Hilversum	6020	9675			







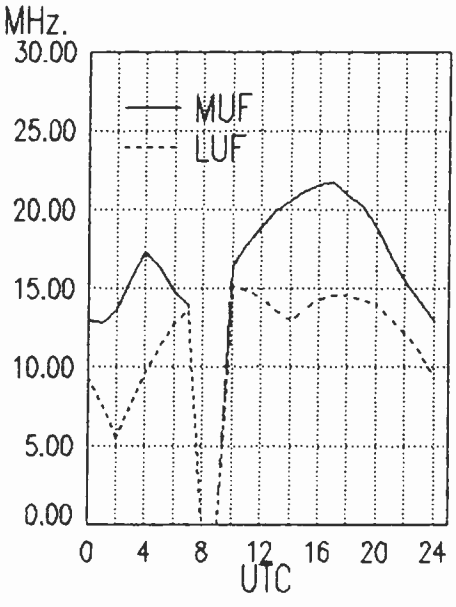
frequency SECTION

1100-1130		HCJB, Quito, Ecuador	6130	11925		
1100-1130		Radio Japan, Tokyo	5990	6120	7210	17810
1100-1130		Radio Mozambique, Maputo	9525	11818	11835	
1100-1130		Radio Sweden Int'l, Stockholm	6065	9630	21690	
1100-1130		SLBC, Colombo, Sri Lanka	11835	15120	17850	[ML]
1100-1130		Swiss Radio Int'l, Berne	11935	13685	15570	
1100-1130		Voice of Vietnam, Hanoi	7430	9732		
1100-1150		Radio Pyongyang, North Korea	6576	9600	11735	
1100-1155		Radio Beijing, China	15455			
1100-1200		ABC, Alice Springs, Australia	2310	[ML]		
1100-1200		ABC, Katherine, Australia	2485			
1100-1200		ABC, Tennant Creek, Australia	2325	[ML]		
1100-1200		(US) Armed Forces Radio and TV	6030	9700		
1100-1200		BBC, London, England	5965	6195	9510	9740
			9750	11750	11775	12095
			15070	15400	18080	
1100-1200		CBN, St. John's, Newfoundland	6160			
1100-1200		CFCF, Montreal, Quebec	6005			
1100-1200		CFCN, Calgary, Alberta	6030			
1100-1200		CHNS, Halifax, Nova Scotia	6130			
1100-1200		CKWX, Vancouver, British Colombia	6080			
1100-1200		CFRB, Toronto, Ontario	6070			
1100-1200		(US) Far East Network, Tokyo	3910			
1100-1200		KYOI, Saipan	11900			
1100-1200		Radio Australia, Melbourne	5995	7215	9580	9645
			9710	9770	11800	
1100-1200		Radio Korea, Seoul, South Korea	15575			
1100-1200		Radio Moscow, USSR	9575	9600	9795	9875
			15500	15225	15475	15490
			17680			
1100-1200		Radio RSA, South Africa	21590			
1100-1200	A,S	Radio Tanzania, Dar es Salaam	7165			
1100-1200	S	Radio Zambia, Lusaka	11880	[IRR]		
1100-1200	S	Superpower KUSW, Utah	9850			
1100-1200		Voice of America, Washington	5975	5985	6110	6165
			9590			
			9760	11715	15160	
1100-1200		Voice of Asia, Taiwan	5980	7445		
1100-1200		Voice of Kenya, Nairobi	7270			
1100-1200		Voice of Nigeria, Lagos	7255	15120		
1100-1200		WHRI, Noblesville, Indiana	5995	11790		
1100-1200		WYFR, Oakland, California	5950	7355		
1110-1120	M-F	Radio Botswana, Gaborone	4820	5955	7255	
1115-1200		Radio Berlin Int'l, East Germany	15445	17880	21465	21540
1115-1125		Radio France Int'l, Paris	6175	9790	9805	11670
			11700	11845	15155	15195
			15300	15315	15435	17620
			17850	21620		
1115-1130		Vatican Radio, Vatican City	11840	21485		
1115-1145		Radio Korea, Seoul, South Korea	7275	11740		
1115-1145		Radio Nepal, Kathmandu	5005			
1115-1200		Trans World Radio, Bonaire	11815			
1130-1157		Radio Austria Int'l, Vienna	15320			
1130-1200		Deutsche Welle, West Germany	15410	17765	17800	21600
1130-1200		HCJB, Quito, Ecuador	11740			
1130-1200		Radio Australia, Melbourne	15320			
1130-1200		Radio Japan, Tokyo	5990	6120	7210	
1130-1200		Radio Netherland, Hilversum	5995	9715	15560	17575
			17605	21480		
1130-1200		Radio Thailand, Bangkok	9655	11905		
1130-1200		Radio Tirana, Albania	9480	11855		
1130-1200		Voice of Islamic Republic Iran	11790			
1135-1140		All India Radio, New Delhi	6065	7110	9610	9675
			11850	15320		
1140-1145	M-A	Vatican Radio, Vatican City	6248	9645	11740	
1145-1200		BBC, London, England*	5995	7180		
1145-1200		Radio Bangladesh, Dakha	15255	17740		
1145-1200		Radio Prague, Czechoslovakia	6055	7345	9505	

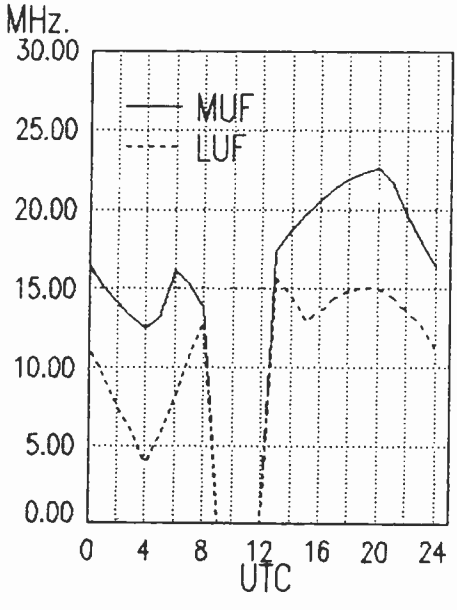
1200 UTC [8:00 AM EDT/5:00 AM PDT]

1200-1205	M-A	Port Moresby, Papua New Guinea	3295	4890	5960	6020
			6040	6080	6140	9520
1200-1215		BBC, London, England*	3915	6065	7275	
1200-1215		Radio Bangladesh, Dahka	15255	17740		
1200-1215		Radio New Zealand, Wellington	6100	9540		
1200-1215		Vatican Radio, Vatican City	15190	17865		
1200-1215		Voice of Kampuchea, Phnom-Penh	9693	11938		

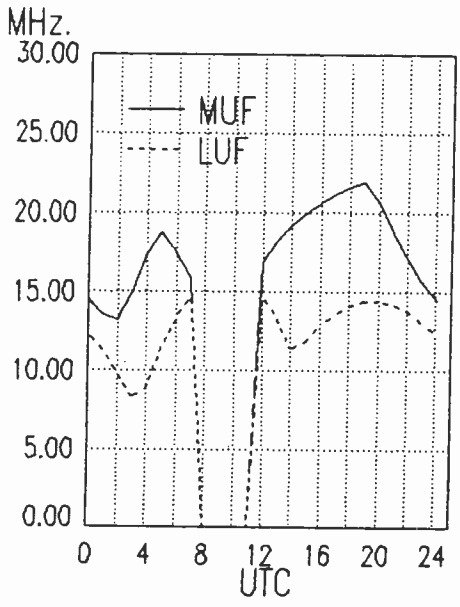
Midwest To
Middle East



West Coast To
Central Africa



West Coast To
East Africa

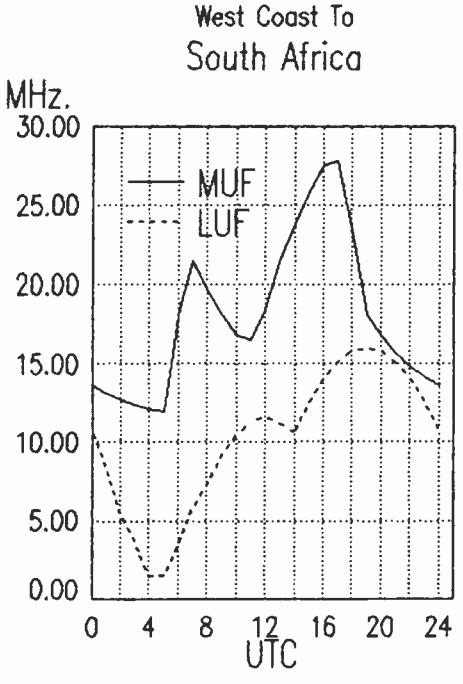


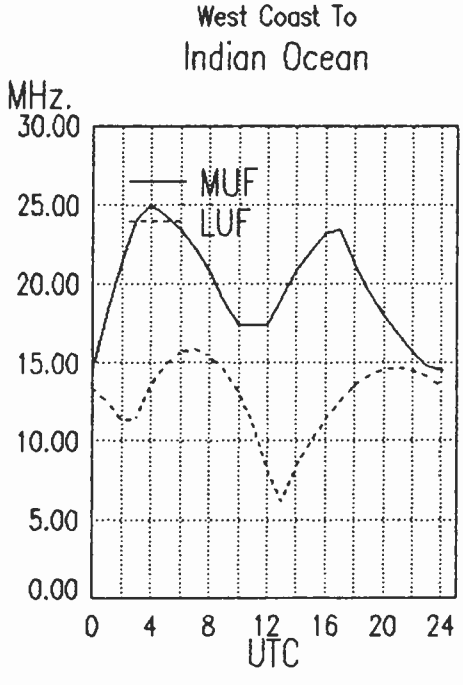
frequency SECTION

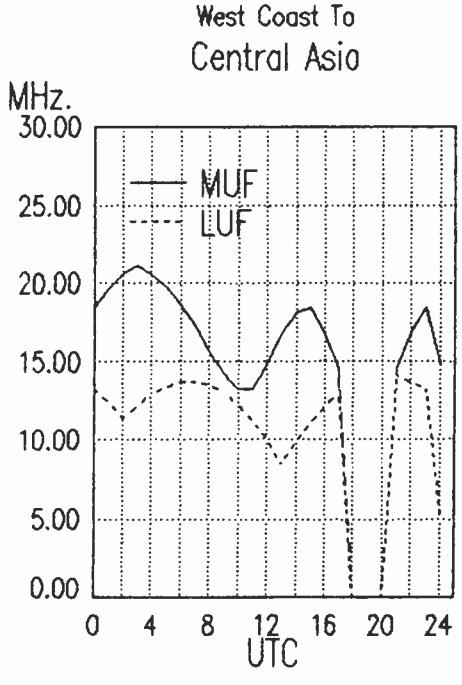
1200-1220		Radio Bucharest, Romania	17720	21665			
1200-1225	M-F	Radio Finland, Helsinki	11945	15400			
1200-1225		Radio Polonia, Warsaw, Poland	6095	7285			
1200-1230	S	Radio Austria Int'l, Vienna	6155	9685	11915	15320	
1200-1230		Radio Netherland, Hilversum	5995	9715	15560	17575	
			17605	21480			
1200-1230		Radio Tashkent, Uzbek, USSR	11785	15460			
1200-1230		Radio Thailand, Bangkok	9655	11905			
1200-1230	S	Radio Zambia, Lusaka	11880	[IRR]			
1200-1230		Swiss Radio Int'l, Berne	6165	9535	12030		
1200-1230		Voice of Islamic Republic Iran	11790				
1200-1235	M-A	Radio Ulan Bator, Mongolia	9615	12015			
1200-1236		HCJB, Quito, Ecuador	6075				
1200-1250		Radio Pyongyang, North Korea	9600	9555	11735		
1200-1255		Radio Beijing, China	7280	15280	15455		
1200-1300		ABC, Alice Springs, Australia	2310	[ML]			
1200-1300		ABC, Katherine, Australia	2485				
1200-1300		ABC, Tennant Creek, Australia	2325	[ML]			
1200-1300	S	Adventist World Radio, Africa	17890				
1200-1300		(US) Armed Forces Radio and TV	6030	15330	15430		
1200-1300		BBC, London, England	6195	9510	9750	11750	
			11775	12095	15070	17790	
1200-1300		CBN, St. John's, Newfoundland	6160				
1200-1300		CFCF, Montreal, Quebec	6005				
1200-1300		CFCN, Calgary, Alberta	6030				
1200-1300		CHNS, Halifax, Nova Scotia	6130				
1200-1300		CKWX, Vancouver, British Colombia	6080				
1200-1300		CFRB, Toronto, Ontario	6070				
1200-1300		(US) Far East Network, Tokyo	3910				
1200-1300		HCJB, Quito, Ecuador	11740	15115	17890		
1200-1300		KYOI, Saipan	11900				
1200-1300		Radio Australia, Melbourne	5995	6060	6080	7205	
			7215	9580	9710	9770	
			11800				
1200-1300		Radio Moscow, USSR	7370	9600	9795	9875	
			11930	12050	15500	15225	
			15490				
1200-1300		Radio RSA, South Africa	21590				
1200-1300	A,S	Radio Tanzania, Dar es Salaam	7165				
1200-1300		SBC Radio One, Singapore	5010	5052	11940		
1200-1300	S	Superpower KUSW, Utah	9850				
1200-1300		Trans World Radio, Bonaire	11815				
1200-1300		Trans World Radio, Sri Lanka	11920				
1200-1300		Voice of America, Washington	6110	9760	11715	15160	
			15425				
1200-1300		Voice of Kenya, Nairobi	7270				
1200-1300		Voice of Nigeria, Lagos	7255	15120			
1200-1300		WCSN, Boston, Massachusetts	5980				
1200-1300		WHRI, Noblesville, Indiana	5995	11790			
1200-1300		WYFR, Oakland, California	7355	9565			
1215-1300		Radio Berlin Int'l, E. Germany	15240	17880			
1215-1300		Radio Cairo, Egypt	17675				
1230-1235		All India Radio, New Delhi	3905	4800	4920	7280	
			9565	9615	11620	11735	
			15120				
1230-1245		Radio Korea, Seoul, South Korea	7275	11740			
1230-1300		BBC, London, England*	6125	7255	6195	9635	
			9660	11780	12040	15270	
			15390	15435	17695		
1230-1300		Radio Bangladesh, Dhaka	11750	15525			
1230-1300		Radio Sweden, Stockholm	15190				
1240-1250	M	Radio Free Europe, Munich*	5985	7115	9695	9725	
			11895	15355			
1245-1255		Radio France Int'l, Paris	9805	11670	11845	15300	
			15365				
			17720	21645			
1245-1300		Radio Berlin Int'l, E. Germany	9665	11705	11785	15170	
			15240				

1300 UTC [9:00 AM EDT/6:00 AM PDT]

1300-1305		Port Moresby, Papua New Guinea	3295	4890	5960	5980	
			6020	6040	6080	6140	
			9520				
1300-1315		Radio Berlin Int'l, East Germany	21465	21540			
1300-1325		Radio Bucharest, Romania	9690	11940	16405	17720	
1300-1330		BBC, London, England	5995	6195	7180	9510	
			9740	9750	11750	11775	





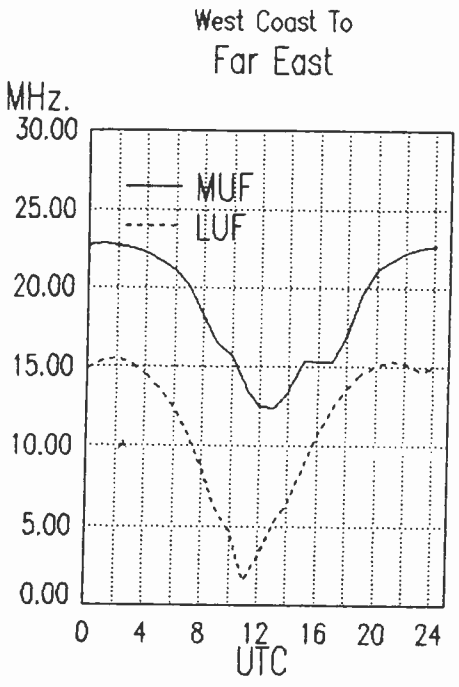


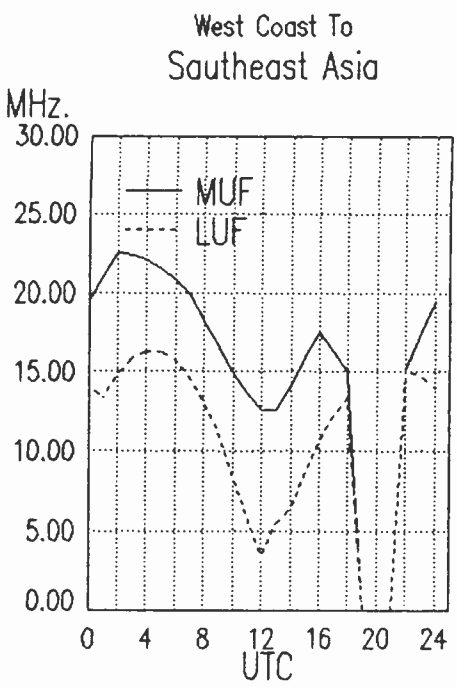
frequency SECTION

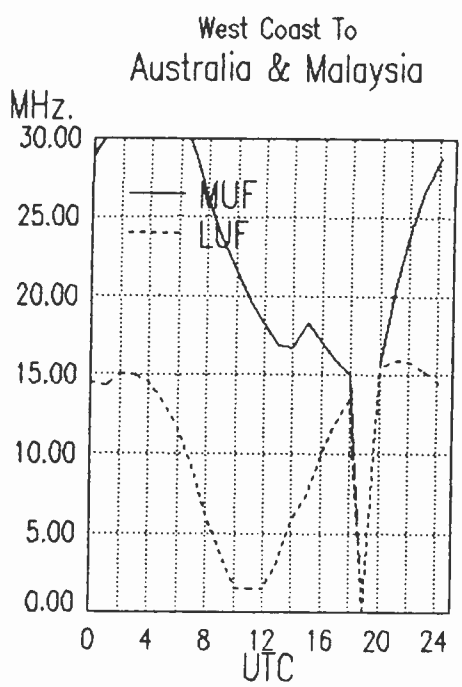
			12095	15070	18080	21470
1300-1330		Radio Berlin Int'l, E. Germany	9665	11705	11785	15170
			15240			
1300-1330		Radio Cairo, Egypt	17675			
1300-1330		Radio Finland, Helsinki	11945	15400		
1300-1330		Radio Ghana, Accra	4915	7295		
1300-1330	S	Radio Norway Int'l, Oslo	17810			
1300-1330		Swiss Radio Int'l, Berne	11965			
1300-1330		Trans World Radio, Sri Lanka	11920			
1300-1330		Voice of Kenya, Nairobi	7270			
1300-1332	A,S	Trans World Radio, Bonaire	11815			
1300-1350		Radio Pyongyang, North Korea	9325	9345	9600	
1300-1355		Radio Beijing, China	11600	11755	15280	15455
1300-1400		ABC, Alice Springs, Australia	2310	[ML]		
1300-1400		ABC, Katherine, Australia	2485			
1300-1400		ABC, Tennant Creek, Australia	2325	[ML]		
1300-1400		(US) Armed Forces Radio and TV	9700	15330	15430	
1300-1400		CBC Northern Quebec Service	9625	11720		
1300-1400		CBN, St. John's, Newfoundland	6160			
1300-1400		CBU, Vancouver, British Colombia	6160			
1300-1400		CFCF, Montreal, Quebec	6005			
1300-1400		CFCN, Calgary, Alberta	6030			
1300-1400		CHNS, Halifax, Nova Scotia	6130			
1300-1400		CKWX, Vancouver, British Colombia	6080			
1300-1400		CFRB, Toronto, Ontario	6070			
1300-1400	S	ELWA, Monrovia, Liberia	11830			
1300-1400		(US) Far East Network, Tokyo	3910			
1300-1400		FEBC, Manila, Philippines	11850			
1300-1400		HCJB, Quito, Ecuador	11740	15115	17890	
1300-1400	M-A	KYOI, Saipan	11900			
1300-1400		Radio Australia, Melbourne	5995	6060	6080	7205
			9580			
1300-1400	S	Radio Canada Int'l, Montreal	9625	11720	11955	15440
			17820			
1300-1400		Radio Jordan, Amman	9560			
1300-1400		Radio Korea, Seoul	9570	9750	15575	
1300-1400		Radio Moscow, USSR	5920	6167.8 LSB		7110
			7370	9655	9820	9825
			9895	11655	11840	11900
			11930	11940	12025	15140
			15150	15225		
1300-1400	A,S	Radio Tanzania, Dar es Salaam	7165			
1300-1400		SBC Radio One, Singapore	5010	5052	11940	
1300-1400	S	Superpower KUSW, Utah	9850			
1300-1400		Voice of America, Washington	6110	9760	11715	15160
1300-1400		Voice of Malaysia	7295			
1300-1400		Voice of Nigeria, Lagos	7255	15120		
1300-1400		WCSN, Boston, Massachusetts	5980			
1300-1400		WHRI, Noblesville, Indiana	9455	11790		
1300-1400		WYFR, Oakland, California	5950	7355	9565	
1300-1400		WYFR Satellite Net, California	13695			
1305-1315		Radio France Int'l, Paris	6175	9790	9805	11670
			11845	15155	15195	15300
			15315	15365	17620	17720
			17850	21645		
1330-1355	M-A	BRT, Brussels, Belgium	15510	15590		
1330-1400		BBC, London, England	5995	6195	9510	9750
			11750	12095	15510	21470
1330-1400		All India Radio, New Delhi	9545	10330	11810	15335
1330-1400	M-A	Bhutan Bcasting Service, Thimpu	6035			
1330-1400		Laotian National Radio	7113			
1330-1400		Radio Finland, Helsinki	11945	15400		
1330-1400		Radio Korea, Seoul, South Korea	7275			
1330-1400		Radio Tashkent, Uzbek, USSR	5945	7275	9540	9600
			11785			
1330-1400		Swiss Radio Int'l, Berne	11695	13685	15135	15570
			17830	21695		
1330-1400		UAE Radio, United Arab Emirates	11940	15435	17865	
1330-1400		Voice of Islamic Republic Iran	9525	9685	9770	
1330-1400		Voice of Kenya, Nairobi	6100			
1330-1400		Voice of Turkey, Ankara	15255			
1330-1400		Voice of Vietnam, Hanoi	9840	15010		
1332-1400	A	Trans World Radio, Bonaire	11815			

1400 UTC [10:00 AM EDT/6:00 AM PDT]

1400-1425		Radio Austria Int'l, Vienna	9665	12010	15320	
1400-1425		Radio Finland, Helsinki	11945	15400		



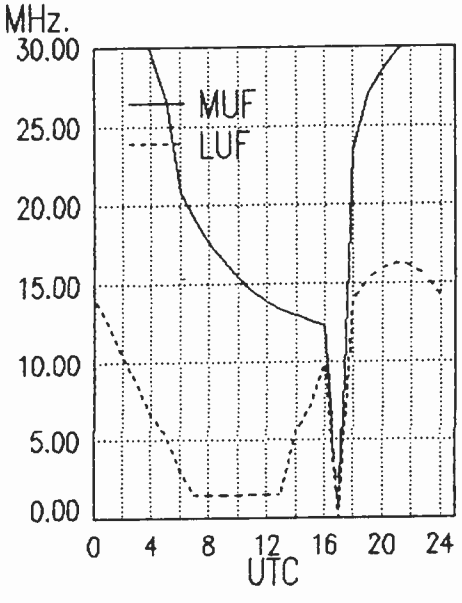




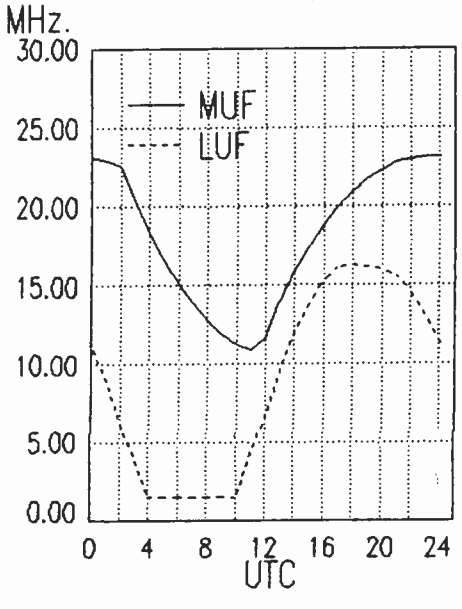
frequency SECTION

1400-1427		Voice of Nigeria, Lagos	15120
1400-1430		ABC, Alice Springs, Australia	2310 [ML]
1400-1430		ABC, Tennant Creek, Australia	2325 [ML]
1400-1430		Radio Finland, Helsinki	11755 15185 17800
1400-1430	S	Radio Norway Int'l, Oslo	15300 15305 15310
1400-1430		Radio Peace and Progress, USSR	17645
1400-1430		Radio Polonia, Warsaw, Poland	6095 7285
1400-1430		Radio Sweden, Stockholm	15345 15390
1400-1430		Radio Tirana, Albania	9500 11985
1400-1430		Voice of Ethiopia, Addis Ababa	9550 11710
1400-1430		Voice of Republic of Iran	15085
1400-1450	T	Radio Free Europe, Munich*	5985 7115 7695 9725
			11895 15355
1400-1450		Radio Pyongyang, North Korea	6576 11735
1400-1455		Radio Beijing, China	11600 15165
1400-1500		ABC, Katherine, Australia	2485
1400-1500		ABC, Perth, Australia	9610
1400-1500		Adventist World Radio, Italy	7275
1400-1500		All India Radio, New Delhi	9545 11810 15335
1400-1500		(US) Armed Forces Radio and TV	9700 15330 15430
1400-1500		BBC, London, England	5995 6195 7180 9740
			9750 11750 12095 15070
			15260 17705 17790 21710
			21470
1400-1500		CBN, St. John's, Newfoundland	6160
1400-1500		CBC Northern Quebec Service	9625 11720
1400-1500	M-A	CBU, Vancouver, British Colombia	6160
1400-1500		CFCF, Montreal, Quebec	6005
1400-1500		CFCN, Calgary, Alberta	6030
1400-1500		CHNS, Halifax, Nova Scotia	6130
1400-1500		CKWX, Vancouver, British Colombia	6080
1400-1500		CFRB, Toronto, Ontario	6070
1400-1500	S	ELWA, Monrovia, Liberia	11830
1400-1500		(US) Far East Network, Tokyo	3910
1400-1500		FEBC, Manila, Philippines	9670 11850
1400-1500		HCJB, Quito, Ecuador	11740 15115 17890
1400-1500		KNLS, Anchor Point, Alaska	9750
1400-1500		KYOI, Saipan	11900
1400-1500		Radio Australia, Melbourne	5995 6035 6060 6080
			7205 9580
1400-1500	S	Radio Canada Int'l, Montreal	15305
1400-1500		Radio Japan, Tokyo	9695 11815
1400-1500		Radio Jordan, Amman	9560
1400-1500		Radio Moscow, USSR	5920 6067.8 LSB 7110
			7300 7370 9655 9825
			9895 11655 11840 11900
			11930 12025 12055 13680
1400-1500		Radio RSA, South Africa	21590
1400-1500	A,S	Radio Tanzania, Dar es Salaam	7165
1400-1500		SBC Radio One, Singapore	5010 5052 11940
1400-1500	S	Superpower KUSW, Utah	9850
1400-1500		Voice of America, Washington	9645 9760 15160
1400-1500		Voice of Kenya, Nairobi	6100
1400-1500		Voice of Malaysia, Kuala Lumpur	4950
1400-1500		Voice of Nigeria, Lagos	7255
1400-1500		WCSN, Boston, Massachusetts	13760
1400-1500		WHRI, Noblesville, Indiana	9455 11790
1400-1500		WRNO, New Orleans, Louisiana	11965
1400-1500		WYFR, Oakland, California	5950 9535 11830 15055
1400-1500		WYFR Satellite Net	13695
1415-1420		Radio Nepal, Kathmandu	3230 5005
1415-1500		Radio Berlin Int'l, East Germany	15240 17880
1425-1500	S	Radio Austria Int'l, Vienna	9665 12010 15320
1430-1455	M-A	Radio Budapest, Hungary	9585 9835 11910 15160
			15220
1430-1500	F	ABC, Alice Springs, Australia	2310 [ML]
1430-1500	F	ABC, Tennant Creek, Australia	2325 [ML]
1430-1500		Burma Broadcasting Service	5985
1430-1500		King of Hope, Southern Lebanon	6280
1430-1500		KTWR, Agana, Guam	9780
1430-1500		Radio Australia, Melbourne	6060 9580
1430-1500		Radio Netherland, Hilversum	11740 13770 15560 17575
1430-1500		Radio Prague, Czechoslovakia	9605 11685 13715 15110
			15155 17705 21505
1430-1500		Radio Sofia, Bulgaria	7245 9740 11735
1430-1500		Radio Yugoslavia, Belgrade	7240 15240 15415
1445-1500		Radio Berlin Int'l, East Germany	11785 15170 15255
1445-1500	M-F	Radio Canada Int'l, Montreal	11915 11935 15160 15325
			15305 17820
1445-1500	M-A	Radio Ulan Bator, Mongolia	9575 15305

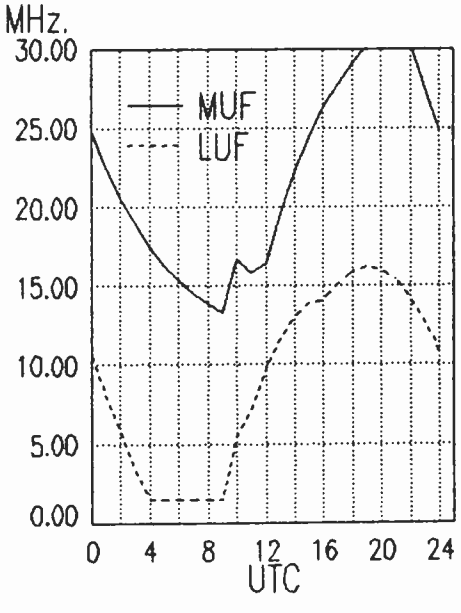
West Coast To
Pacific



West Coast To
Central America/Carribean



West Coast To
South America

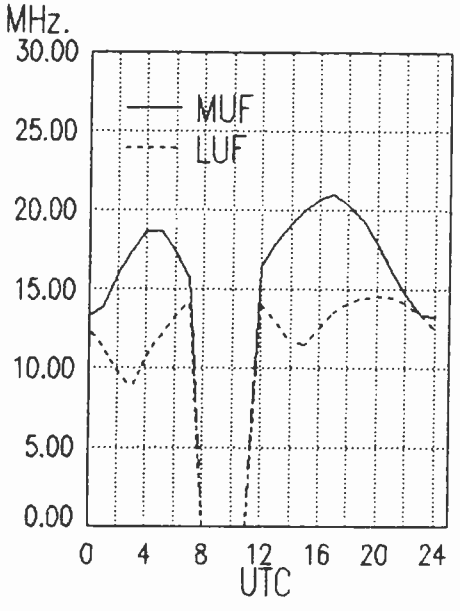


frequency SECTION

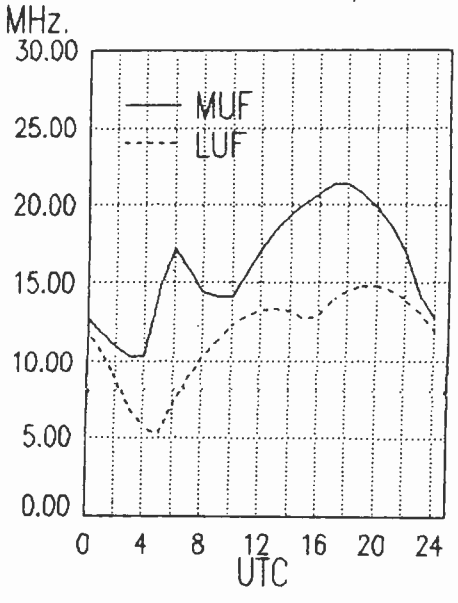
1500 UTC [11:00 AM EDT/7:00 AM PDT]

1500-1505		Africa No. 1, Gabon	7200 15200
1500-1510		Vatican Radio, Vatican City	11960 15090 17870
1500-1515		FEBA, Mahe, Seychelles	15325
1500-1520		Radio Ulan Bator, Mongolia	9575 15305
1500-1525		Radio Bucharest, Romania	9510 9690 11775 11940 15250 15335
1500-1525		Radio Netherland, Hilversum	11740 13770 15560 17575
1500-1530		Radio Berlin Int'l, East Germany	11785 15170 15255
1500-1530		Radio Sofia Bulgaria	7245 9560 11735 15310
1500-1530	A,S	Radio Tanzania, Dar es Salaam	7165
1500-1530		Radio Veritas Asia, Philippines	9770 15215
1500-1550		Deutsche Welle, West Germany	7225 9735 17765 15135 21600
1500-1550		KTWR, Agana, Guam	9820
1500-1550		Radio Pyongyang, North Korea	6576 7290 9325 9640 9977
1500-1555		Radio Beijing, China	11600 15165
1500-1600	F	ABC, Alice Springs, Australia	2310 [ML]
1500-1600		ABC, Perth, Australia	9610
1500-1600	F	ABC, Tennant Creek, Australia	2325 [ML]
1500-1600		(US) Armed Forces Radio and TV	9700 15330 15430
1500-1600		AWR, Alajuela, Costa Rica	15460
1500-1600		BBC, London, England	5995 6195 7180 9740 11750 11775 12095 15070 15260 15400 15420 17705 17830 17885 21470 21710
1500-1600		Burma Broadcasting Service	5985
1500-1600		CBC Northern Quebec Service	9625 11720
1500-1600		CBN, St. John's, Newfoundland	6160
1500-1600		CBU, Vancouver, British Colombia	6160
1500-1600		CFCF, Montreal, Quebec	6005
1500-1600		CFCN, Calgary, Alberta	6030
1500-1600		CHNS, Halifax, Nova Scotia	6130
1500-1600		CKWX, Vancouver, British Colombia	6080
1500-1600		CFRB, Toronto, Ontario	6070
1500-1600	S	ELWA, Monrovia, Liberia	11830
1500-1600		(US) Far East Network, Tokyo	3910
1500-1600		FEBC, Manila, Philippines	11850
1500-1600		HCJB, Quito, Ecuador	11740 11810 15115 17890
1500-1600		King of Hope, Southern Lebanon	6280
1500-1600		KNLS, Anchor Point, Alaska	9750
1500-1600		KSDA, Agat, Guam	11980
1500-1600		KYOI, Saipan	11900
1500-1600		Radio Australia, Melbourne	5995 6035 6060 6080 7205 7215 9580
1500-1600	S	Radio Canada Int'l, Montreal	9555 9625 11720 11915 11955 15315 15440 17820
1500-1600		Radio Japan, Tokyo	9505 9695 11815 21700
1500-1600		Radio Jordan, Amman	9560
1500-1600		Radio Moscow, USSR	5920 7110 7300 7370 9655 9825 9895 11900 11840 11900
1500-1600		Radio RSA, South Africa	9655 15125 17755 21590
1500-1600		SBC Radio One, Singapore	5010 5052 11940
1500-1600	S	Superpower KUSW, Utah	9850
1500-1600		Voice of America, Washington	9000 9760 15205
1500-1600		Voice of Ethiopia, Addis Ababa	7165 9560
1500-1600		Voice of Indonesia, Jakarta	11790 15150
1500-1600		Voice of Kenya, Nairobi	6100
1500-1600		Voice of Malaysia, Kuala Lumpur	4950
1500-1600		Voice of Nigeria, Lagos	7255 11770
1500-1600		WCSN, Boston, Massachusetts	13760
1500-1600		WHRI, Noblesville, Indiana	15105 21640
1500-1600		WRNO, New Orleans, Louisiana	11965
1500-1600		WYFR, Oakland, California	5950 6175 13695 15170 15375 17612
1500-1600	M-A	WYFR Satellite Net, California	13695 15375
1505-1530		Radio Finland, Helsinki	11850 15185
1515-1600		Radio Berlin Int'l, East Germany	6115 7295 9730
1515-1600		FEBA, Mahe, Seychelles	11865 15325
1530-1545		All India Radio, New Delhi	3905 3925 4860 6160 7160 7412 9545 9950
1530-1555	M-A	BRT, Brussels, Belgium	17595 15510 21810

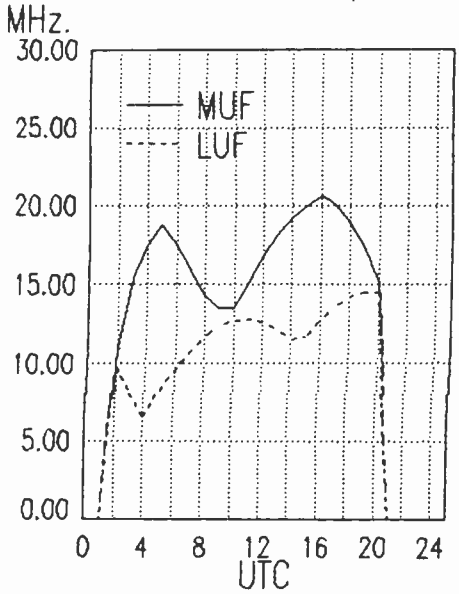
West Coast To
Middle East



West Coast To
Western Europe



West Coast To
Eastern Europe

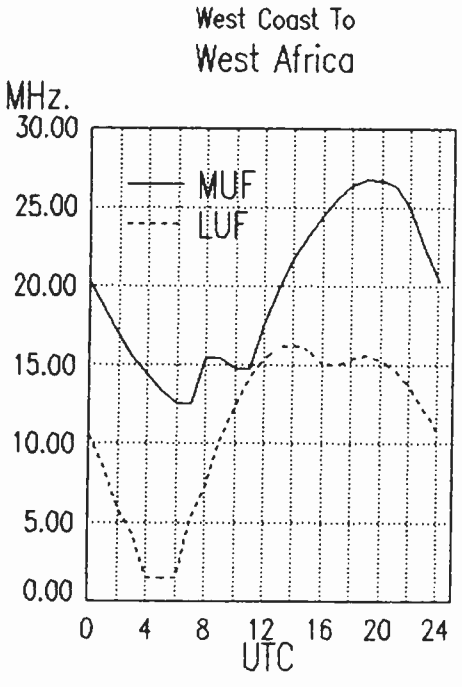


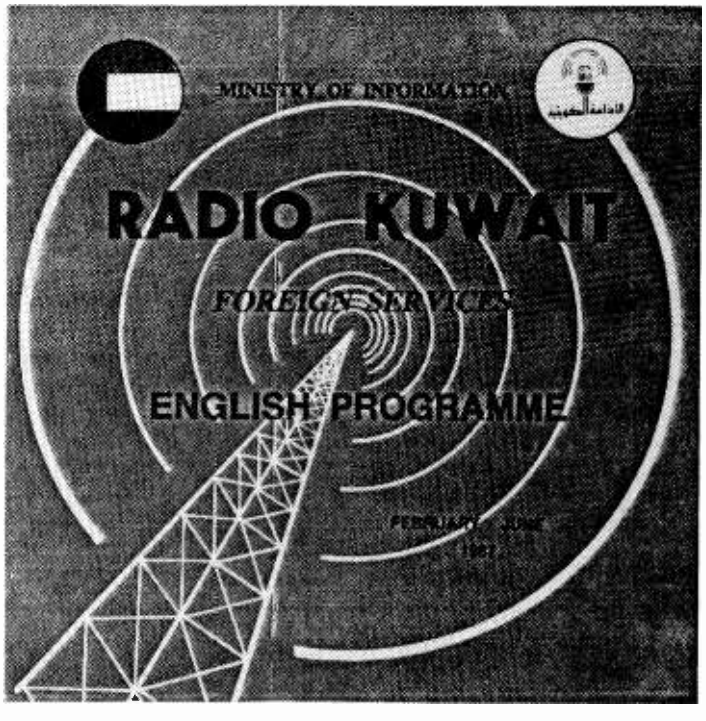
frequency SECTION

1530-1555		Radio Austria Int'l, Vienna	6155	11780	11915	
1530-1600		Radio Prague, Czechoslovakia	6055	7345	9605	11665
			11685	11990	15110	13715
			17705	21505		
1530-1600		Radio Tanzania, Dar es Salaam	9684			
1530-1600		Radio Tirana, Albania	9480	11835		
1530-1600		Swiss Radio Int'l, Berne	9885	15430	17830	13685
1530-1600		Voice of Asia, Taiwan	5980	7445		
1530-1600		Voice of Nigeria, Lagos	15120			
1540-1550	M-A	Voice of Greece, Athens	9855	11645	15630	
1545-1600		Radio Canada Int'l, Montreal	9555	11915	11935	15315
			15325	17820		
1545-1600		Radio Korea, Seoul, South Korea	7275	9870		
1545-1600		Vatican Radio, Vatican City	11810	15120	17730	
1550-1600	H-S	KTWR, Agana, Guam	9780			

1600 UTC [12:00 PM EDT/9:00 AM PDT]

1600-1610		FEBA, Mahe, Seychelles	11865	15325		
1600-1610		Radio Lesotho, Maseru	4800			
1600-1610		SBC Radio One, Singapore	5010	5052	11940	
1600-1625		Radio Budapest, Hungary	6110	9585	9835	11910
			15160			
1600-1625		Radio Prague, Czechoslovakia	6055	7345	9605	11665
			11685	11990	15110	13715
			15110	17705	21505	
1600-1630		ELWA, Monrovia, Liberia	11830			
1600-1630	S	Radio Norway Int'l, Oslo	9660	11850	11870	15310
1600-1630		Radio Pakistan, Islamabad	7365	9465	9785	11615
			11625	15125		
1600-1630		Radio Polonia, Warsaw, Poland	6135	9540		
1600-1630	M-F	Radio Portugal, Lisbon	15245			
1600-1630		Radio Sweden, Stockholm	6065	11855		
1600-1630		SLBC, Colombo, Sri Lanka	6075	9720		
1600-1630		Trans World Radio, Swaziland	5055	9525		
1600-1630		Voice of Asia, Taiwan	5980	7445		
1600-1630		Voice of Vietnam, Hanoi	9840	12020		
1600-1645	H-A	KTWR, Agana, Guam	9820			
1600-1645		Radio Nacional Angola, Luanda	7245	9535	11955	
1600-1645		UAE Radio, United Arab Emirates	11730	15320	17865	
1600-1655		Radio Beijing, China	7295	9570	11715	15130
1600-1700	F	ABC, Alice Springs, Australia	2310	[ML]		
1600-1700		ABC, Perth, Australia	9610			
1600-1700	F	ABC, Tennant Creek, Australia	2325	[ML]		
1600-1700		(US) Armed Forces Radio and TV	9700	15330	15430	
1600-1700		AWR, Alajuela, Costa Rica	15460			
1600-1700		BBC, London, England	5975	5995	6195	7105
			7180	9515	9605	9740
			11705	11820	12095	15070
			15260	15400	17885	
1600-1700		CBC Northern Quebec Service	9625	11720		
1600-1700		CBN, St. John's, Newfoundland	6160			
1600-1700		CBU, Vancouver, British Colombia	6160			
1600-1700		CFCF, Montreal, Quebec	6005			
1600-1700		CFCN, Calgary, Alberta	6030			
1600-1700		CHNS, Halifax, Nova Scotia	6130			
1600-1700		CKWX, Vancouver, British Colombia	6080			
1600-1700		CFRB, Toronto, Ontario	6070			
1600-1700		(US) Far East Network, Tokyo	3910			
1600-1700		HCJB, Quito, Ecuador	11740	15115	17890	
1600-1700	S	KCBI, Dallas, Texas	11735			
1600-1700		Radio Australia, Melbourne	5995	6035	6060	6080
			7205	7215	9580	
1600-1700		Radio Beijing, China	15130			
1600-1700		Radio Canada Int'l, Montreal	9625	11720	11955	15440
			17820			
1600-1700		Radio France Int'l, Paris	6175	9860	11705	11995
1600-1700		Radio Jordan, Amman	9560			
1600-1700		Radio Korea, Seoul, South Korea	5975	9870		
1600-1700		Radio Malawi, Blantyre	3380	5995		
1600-1700		Radio Moscow, USSR	5905	5920	5980	6020
			6050	6095	6165	7105
			7115	7135	7150	7315
			7345	7440	9565	11670
			11840			
1600-1700		Radio Riyadh, Saudi Arabia	9705	9720		
1600-1700		Radio Tanzania, Dar es Salaam	9684			
1600-1700		Radio Zambia, Lusaka	9580			





frequency SECTION

1600-1700	S	Superpower KUSW, Utah	15225
1600-1700		Voice of America, Washington	9575 9700 9760 15205 15410 15445 15580 15600 17785 17800 17870
1600-1700		Voice of Kenya, Nairobi	6100
1600-1700		Voice of Nigeria, Lagos	7255 15120

1700 UTC [1:00 PM EDT/10:00 AM PDT]

1700-1705		Radio Uganda, Kampala	4976 5026
1700-1715		Kol Israel, Jerusalem	9385 9640 9925 11585
1700-1715	M-A	Voice of Namibia (Angola)	11955
1700-1725		Radio Netherland, Hilversum	6020 15570
1700-1730		Radio Australia, Melbourne	5995 6060 6080 7205 9580
1700-1730		Radio Berlin Int'l, East Germany	6115 7260 9730
1700-1730		Radio Japan, Tokyo	5990 11815
1700-1730	S	Radio Norway Int'l, Oslo	9655 15220 15310
1700-1730		Radio Sweden Int'l, Oslo	6065
1700-1730		Swiss Radio Int'l, Berne	3985 6165 9535
1700-1745		BBC, London, England	5975 5995 9515 9740 11820 12095 15070 15260 15400 17885
1700-1750		Radio Pyongyang, North Korea	7290 9325 9640 9977
1700-1755		Radio Beijing, China	7295 9570
1700-1800	F	ABC, Alice Springs, Australia	2310 [ML]
1700-1800		ABC, Tennant Creek, Australia	2325 [ML]
1700-1800		(US) Armed Forces Radio and TV	9700 15330 15430
1700-1800		AWR Africa, Gabon	9625
1700-1800		CBC Northern Quebec Service	9625 11720
1700-1800		CBN, St. John's, Newfoundland	6160
1700-1800		CBU, Vancouver, British Colombia	6160
1700-1800		CFCF, Montreal, Quebec	6005
1700-1800		CFCN, Calgary, Alberta	6030
1700-1800		CHNS, Halifax, Nova Scotia	6130
1700-1800		CKWX, Vancouver, British Colombia	6080
1700-1800		CFRB, Toronto, Ontario	6070
1700-1800		(US) Far East Network, Tokyo	3910
1700-1800	A,S	KCBI, Dallas, Texas	11735
1700-1800		Radio Havana Cuba	11920
1700-1800		Radio Jordan, Amman	9560
1700-1800	M-F	Radio Malabo, Equatorial Guinea	9553 [ML]
1700-1800		Radio Moscow, USSR	11840 13790
1700-1800		Radio Riyadh, Saudi Arabia	9705 9720
1700-1800		Radio Tanzania, Dar es Salaam	9684
1700-1800		Radio Zambia, Lusaka	9580
1700-1800		RTM Morocco	17815
1700-1800		SBC Radio One, Singapore	5052 11940
1700-1800	A,S	Swaziland Commercial Radio	6155
1700-1800	S	Superpower KUSW, Utah	15225
1700-1800		Voice of Africa, Egypt	15255
1700-1800		Voice of America, Washington	6110 9575 9645 11760 11920 15410 15445 15580 15600 17785 17800 17870
1700-1800		Voice of Kenya, Nairobi	6100
1700-1800		Voice of Nigeria, Lagos	11770
1700-1800		WCSN, Boston, Massachusetts	21640
1700-1800		WHRI, Noblesville, Indiana	15105
1700-1800		WINB, Red Lion, Pennsylvania	15295
1700-1800	S-F	WMLK, Bethel, Pennsylvania	9465
1700-1800		WRNO, New Orleans, Louisiana	15420
1700-1800		WYFR, Oakland, California	9535 11580 11830 13695 15170
1700-1800		WYFR Satellite Net, California	13760
1715-1730		Radio Korea, Seoul, South Korea	9870 15575
1715-1745		BBC, London, England*	3975 6185 7165
1715-1800		Radio Berlin Int'l, East Germany	9665 15145 15255
1718-1800		Radio Pakistan, Islamabad	6210 7835
1725-1740		Radio Suriname Int'l, Paramibo	7835v
1725-1800		Radio New Zealand, Wellington	11780 15150
1730-1735		All India Radio, New Delhi	4840 4860 4920 6160 7412 9950
1730-1755		BRT Brussels, Belgium	5910 11695
1730-1800		KNLS, Anchor Point, Alaska	7355
1730-1755		Radio Bucharest, Romania	7105 9530 9685 11790 11940
1730-1800		Radio Australia, Melbourne	5995 6035 6060 6080 7205 9580
1730-1800		Radio Berlin Int'l, E. Germany	6115 7260 9730
1730-1800		Radio Polonia, Warsaw, Poland	6135 9540
1730-1800		Radio Prague, Czechoslovakia	9605 11685 11695 11990 13715 15110
1730-1800		Radio Sofia, Bulgaria	7245 9560 11735 15310
1730-1800		Radio Yugoslavia, Belgrade	5980 6100 7240 11735
1730-1800		RAE, Buenos Aires, Argentina	15345
1734-1800		FEBA, Mahe, Seychelles	11760
1745-1800		BBC, London, England	9515 9740 12095 15070 15260 15400
1745-1800		SLBC, Colmbo, Sri Lanka	11800

1800 UTC [2:00 PM EDT/11:00 AM PDT]

1800-1805	A	SBC Radio One, Singapore	11940
1800-1815		Radio Cameroon, Yaounde	3970 4750 4795 4850 5010
1800-1815		SLBC, Colombo, Sri Lanka	11800
1800-1825	A,S	FEBA, Mahe, Seychelles	11760
1800-1825		Radio Prague, Czechoslovakia	9605 11685 11990 13715 15110 21505
1800-1825		RAE, Buenos Aires, Argentina	15345
1800-1830		BBC, London, England	9740 11820 12095 15070 15400
1800-1830	S	Radio Bamako, Mali	4835 5995
1800-1830		Radio Canada Int'l, Montreal	15260 17820
1800-1830		Radio Mozambique, Maputo	3265 4855 9618
1800-1830		Radio Prague, Czechoslovakia	5930 7345 13715
1800-1830		Radio Sofia Bulgaria	7245 7155 9700
1800-1830		Swiss Radio Int'l, Berne	3985 6165 9535
1800-1830		Voice of Africa, Egypt	15255
1800-1830		Voice of Vietnam, Hanoi	9840 12020
1800-1845		Radio Abidjan, Ivory Coast	7215
1800-1845		Trans World Radio, Swaziland	9525
1800-1850		Deutsche Welle, West Germany	11785 13790 15135 17715
1800-1850		Radio Bras, Brasilia, Brazil	15265
1800-1856		Radio RSA, South Africa	17880
1800-1900	F	ABC, Alice Springs, Australia	2310 [ML]
1800-1900	F	ABC, Tennant Creek, Australia	2325 [ML]
1800-1900		All India Radio, New Delhi	11935 15360
1800-1900		(US) Armed Forces Radio and TV	9700 15330 15430
1800-1900		CBC Northern Quebec Service	9625 11720
1800-1900		CBN, St. John's, Newfoundland	6160
1800-1900		CBU, Vancouver, British Colombia	6160
1800-1900		CFCF, Montreal, Quebec	6005
1800-1900		CFCN, Calgary, Alberta	6030
1800-1900		CHNS, Halifax, Nova Scotia	6130
1800-1900		CKWX, Vancouver, British Colombia	6080
1800-1900		CFRB, Toronto, Ontario	6070
1800-1900		(US) Far East Network, Tokyo	3910
1800-1900	A,S	KCBI, Dallas, Texas	11735
1800-1900		KNLS, Anchor Point, Alaska	7355
1800-1900		Radio Australia, Melbourne	5995 6035 6060 6080 7205 7215 9580
1800-1900		Radio Jamahiriya, Libya	15450
1800-1900		Radio Korea, Seoul, South Korea	15575
1800-1900		Radio Kuwait, Kuwait	11665
1800-1900	M-F	Radio Malabo, Equatorial Guinea	9553 [ML]
1800-1900		Radio Moscow, USSR	11840 12060
1800-1900		Radio New Zealand, Wellington	11780 15150
1800-1900		Radio Riyadh, Saudi Arabia	9705 9720
1800-1900		Radio Tanzania, Dar es Salaam	9684
1800-1900		Radio Zambia, Lusaka	9580
1800-1900	M-A	Superpower KUSW, Utah	15225
1800-1900	A,S	Swaziland Commercial Radio	6155
1800-1900		Voice of America, Washington	9700 9760 11760 15410 15445 15580 15600 17785 17800 17870 21485

frequency SECTION

1800-1900		Voice of Kenya, Nairobi	6100				
1800-1900		Voice of Nigeria, Lagos	11770	15120			
1800-1900		WCSN, Boston, Massachusetts	15390				
1800-1900		WHRI, Noblesville, Indiana	13760	17830			
1800-1900		WINB, Red Lion, Pennsylvania	15295				
1800-1900	S-F	WMLK, Bethel, Pennsylvania	9465				
1800-1900		WRNO, New Orleans, Louisiana	15420				
1800-1900		WYFR, Oakland, California	11580	15170			
1800-1900		WYFR Satellite Net, California	11830	13695			
1815-1900		Radio Bangladesh, Dhaka	6240	7505			
1830-1855		Radio Austria Int'l, Vienna	5945	6155	11825	12015	
1830-1855		BRT, Brussels, Belgium	5910	9860	11695		
1800-1855		Radio Polonia, Warsaw, Poland	5995	6135	7125	7285	
			9525	11840			
1830-1900		BBC, London, England	12095	15070	15400		
1830-1900		Radio Budapest, Hungary	6110	7220	9585	9835	
			11910	15160			
1830-1900	A,S	Radio Canada Int'l, Montreal	15260	17820			
1830-1900		Radio Finland, Helsinki	6120	9550	11755	15185	
1830-1900		Radio Havana Cuba	15155				
1830-1900		Radio Kuwait	11665				
1830-1900	MWF	Radio Mozambique, Maputo	3265	4855	9618		
1830-1900		Radio Netherland, Hilversum	6020	15175	17605	21685	
1830-1900		Radio Sofia Bulgaria	9700	11720			
1830-1900		Radio Sweden, Stockholm	15240				
1830-1900		Spanish Foreign Radio, Madrid	7275	9765	11840	15375	
1830-1900		Voice of Islamic Republic Iran	9695				
1830-1900		WINB, Red Lion, Pennsylvania	15185				
1840-1850	M-A	Voice of Greece, Athens	11645	12045	15630		
1840-1900		Radio Senegal, Dakar	4950				
1845-1855		Radio Nacional, Conaky, Guinea	4833	4900	7125		
1845-1900		All India Radio, New Delhi	7412	11620			
1855-1900		Africa No. 1, Gabon	4830	15475			

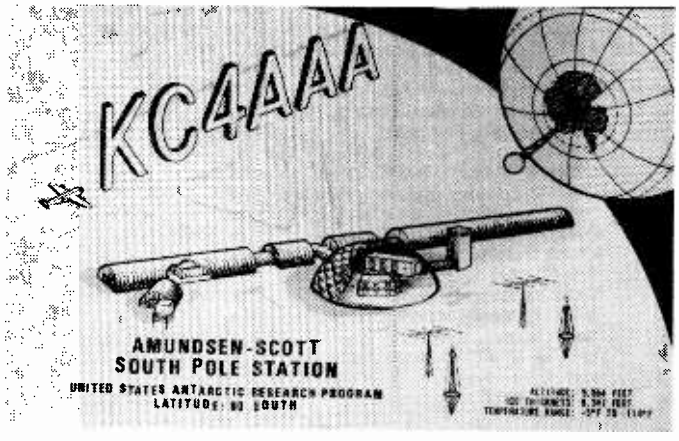
1900 UTC [3:00 PM EDT/12:00 PM PDT]

1900-1903		Africa No. 1, Gabon	15475				
1900-1915		Radio Bangladesh, Dhaka	6240	7505			
1900-1915		Radio Tanzania, Dar es Salaam	9684				
1900-1925		Radio Netherland, Hilversum	6020	15175	17605	21685	
1900-1925		Voice of Islamic Republic Iran	9695				
1900-1930	F	ABC, Alice Springs, Australia	2310	[ML]			
1900-1930	F	ABC, Tennant Creek, Australia	2325	[ML]			
1900-1930		Kol Israel, Jerusalem	11605	15485			
1900-1930		Radio Afghanistan, Kabul	7160	9640			
1900-1930		Radio Berlin Int'l, East Germany	9665	11920	15255		
1900-1930		Radio Japan, Tokyo	9505				
1900-1930		Radio Kiev, Ukraine, USSR	6010	6090	6165	7170	
1900-1930	S	Radio Norway Int'l, Oslo	9590	15220	15310		
1900-1930	M-F	Radio Portugal, Lisbon	11870	15250			
1900-1930		Radio Sofia, Bulgaria	7245	9560	11735	15310	
1900-1930		Radio Yugoslavia, Belgrade	5980	7240	9620		
1900-1930		Spanish Foreign Radio, Madrid	7275	9765	11840	15375	
1900-1930		Voice of Vietnam, Hanoi	9840	12020			
1900-1955		Radio Beijing, China	6860	9470			
1900-2000		All India Radio, New Delhi	7412	11620	11935	15360	
1900-2000		(US) Armed Forces Radio and TV	9700	15330	15430		
1900-2000		BBC, London, England	6180	9410	9740	11820	
			12095	15070			
1900-2000		CBC Northern Quebec Service	9625	11720			
1900-2000		CBN, St. John's, Newfoundland	6160				
1900-2000		CBU, Vancouver, British Colombia	6160				
1900-2000		CFCF, Montreal, Quebec	6005				
1900-2000		CFCN, Calgary, Alberta	6030				
1900-2000		CHNS, Halifax, Nova Scotia	6130				
1900-2000		CKWX, Vancouver, British Colombia	6080				
1900-2000		CFRB, Toronto, Ontario	6070				
1900-2000		(US) Far East Network, Tokyo	3910				
1900-2000		HCJB, Quito, Ecuador	11790	15270	17790		
1900-2000	A,S	KCBI, Dallas, Texas	11735				
1900-2000		KNLS, Anchor Point, Alaska	7355				
1900-2000		KYOI, Saipan	9495				
1900-2000		Radio Algiers, Algeria	9509	9685	15215	17745	
1900-2000		Radio Australia, Melbourne	6035	6060	6080	7205	
			7215	9580			
1900-2000		Radio Ghana, Accra	6130				
1900-2000		Radio Havana Cuba	15155				
1900-2000		Radio Kuwait, Kuwait	11665				
1900-2000	M-A	Radio Malabo, Equatorial Guinea	9553	[ML]			
1900-2000		Radio Moscow, USSR	9735	11840	12060		
1900-2000		Radio New Zealand, Wellington	11780	15150			
1900-2000		Radio Prague, Czechoslovakia	5930	7345			
1900-2000		Radio Riyadh, Saudi Arabia	9705	9720			
1900-2000		Radio Zambia, Lusaka	9580				
1900-2000	M-A	Superpower KUSW, Utah	15400				
1900-2000	A,S	Swaziland Commercial Radio	6155				
1900-2000		Trans World Radio Swaziland	3205				
1900-2000		Voice of America, Washington	9760	11760	15410	15445	
			15580	15600	17785	17800	
			17870				
1900-2000		Voice of Ethiopia, Addis Ababa	9595				
1900-2000		Voice of Kenya, Nairobi	6100				

AMUNDSEN-SCOTT SOUTH POLE STATION
Dedicated January 1975
U.S. ANTARCTIC RESEARCH PROGRAM
Operated For
NATIONAL SCIENCE FOUNDATION
Washington, D. C. 20550
By
ITT ANTARCTIC SERVICES, INC.

To radio C.J. DOIRON Confirming
SSB ~~QSO~~ of SWL REPORT, Sept 10 1982
At 0401 GMT. UR 14.330 MHZ SIGS
Were ~~BST~~ JUMPO S4545
Equipment XCVR: Collins KWM-2A
Linear: Collins 30S1
Antennas: Telrex 20M646X
KLM 40M "Big Sticker"
80M Inverted "V"
TNX for QSO, 73's
Operator Larry

C.John Doiron of Brusly, LA, shares this collector's item, logged in 1982. He says it took him about a year to get it -- but worth it! Temp in Antarctica that day was 95° below zero.



frequency SECTION

1900-2000		Voice of Nigeria, Lagos	7255	11770			
1900-2000		WCSN, Boston, Massachusetts	15390				
1900-2000		WHRI, Noblesville, Indiana	13760	17830			
1900-2000		WINB, Red Lion, Pennsylvania	15295				
1900-2000	S-F	WMLK, Bethel, Pennsylvania	9465				
1900-2000		WRNO, New Orleans, Louisiana	15420				
1900-2000		WYFR, Oakland, California	11830	13695	15170	21615	
1900-2000	M-A	WYFR Satellite Net, California	15375	15440			
1910-1920		Radio Botswana, Gaborone	3356	4820			
1920-1930	M-A	Voice of Greece, Athens	7430	9425	11645		
1930-1940		Radio Togo, Lome	5047				
1930-2000		ABC, Katherine, Australia	2485				
1930-2000		Radio Beijing, China	6955	7480	9440		
1930-2000		Radio Bucharest, Romania	5990	6105	7145	7195	
1930-2000	M-F	Radio Canada Int'l, Montreal	5995	7235	11945	15325	
			17875				
1930-2000		Voice of Republic of Iran	9022	9770			
1935-1955		RAI, Rome, Italy	7275	7290	9575		
1940-2000	M-A	Radio Ulan Bator, Mongolia	9575	11870			
1945-2000		All India Radio, New Delhi	9755	11860			

2000 UTC [4:00 PM EDT/1:00 PM PDT]

2000-2005	S-F	Port Moresby, Papua New Guinea	3295	4890	5960	5985	
			6020	6040	6080	6140	
			9520				
2000-2005		Radio Zambia, Lusaka	3345	6165			
2000-2005	M-A	Vatican Radio, Vatican City	6190	6248	7250	9625	
			9645	11700	15120		
2000-2010	A	Radio Zambia, Lusaka	3345	6165			
2000-2010		Voice of Kenya, Nairobi	6100				
2000-2015		Radio Togo, Lome	3220	5047			
2000-2015	M-A	Radio Ulan Bator, Mongolia	9575	11870			
2000-2015		Trans World Radio, Swaziland	3205				
2000-2025		Radio Beijing, China	6955	7480	9440		
2000-2025		Radio Bucharest, Romania	5990	6105	7145	7195	
2000-2030		KNLS, Anchor Point, Alaska	7355				
2000-2030		Radio Australia, Melbourne	6035	7205	7215	9580	
			9620				
2000-2030		Radio Budapest, Hungary	6110	7220	9585	9835	
			11910	15160			
2000-2030		Radio Canada Int'l, Montreal	9555	6030	11945	15325	
			17820	17875			
2000-2030		Radio Ghana, Nairobi	3366	4915			
2000-2030		Radio Norway International, Oslo	9590	15310			
2000-2030		Radio Polonia, Warsaw, Poland	7125	7145	9525		
2000-2030		Swaziland Commercial Radio	6155				
2000-2030		Voice of Nigeria, Lagos	7255				
2000-2030		Voice of Republic of Iran	9022	9770			
2000-2045		All India Radio, New Delhi	7412	9755	9910	11620	
			11860				
2000-2045		WYFR, Oakland, California	11830	13695	15170	15375	
			15440	17750	21525		
2000-2050		Radio Pyongyang, North Korea	6576	9345	9640	9977	
2000-2056		Radio RSA, South Africa	7270	11900	15252		
2000-2100	M-A	ABC, Alice Springs, Australia	2310	[ML]			
2000-2100		ABC, Katherine, Australia	2485				
2000-2100	M-A	ABC, Tennant Creek, Australia	2325	[ML]			
2000-2100		(US) Armed Forces Radio and TV	15330				
2000-2100		BBC, London, England	12095	15070	15260	15400	
			17760				
2000-2100		CBN, St. John's, Newfoundland	6160				
2000-2100		CBU, Vancouver, British Colombia	6160				
2000-2100		CFCF, Montreal, Quebec	6005				
2000-2100		CFCN, Calgary, Alberta	6030				
2000-2100		CHNS, Halifax, Nova Scotia	6130				
2000-2100		CKWX, Vancouver, British Colombia	6080				
2000-2100		CFRB, Toronto, Ontario	6070				
2000-2100		(US) Far East Network, Tokyo	3910				
2000-2100		Radio Kuwait, Kuwait	11665				
2000-2100		King of Hope, Southern Lebanon	6280				
2000-2100		KVOH, Rancho Simi, California	17775				
2000-2100		KYOI, Saipan	9495				
2000-2100		Radio Baghdad, Iraq	9875				
2000-2100	M-F	Radio Malabo, Equatorial Guinea	9553				
2000-2100		Radio Moscow, USSR	9735	11840	12010		
2000-2100		Radio New Zealand, Wellington	11780	15150			
2000-2100		Radio Riyadh, Saudi Arabia	9705	9720			
2000-2100		Radio Zambia, Lusaka	9580				
2000-2100		Superpower KUSW, Utah	15400				
2000-2100		Voice of America, Washington	9760	11760	15600		
2000-2100		Voice of Turkey, Ankara	9825				
2000-2100		Voice of Nigeria, Lagos	11770				
2000-2100		WCSN, Boston, Massachusetts	15390				
2000-2100		WHRI, Noblesville, Indiana	13760	17830			
2000-2100		WRNO, New Orleans, Louisiana	15420				
2003-2100		WINB, Red Lion, Pennsylvania	15295				
2005-2100		Radio Damascus, Syria	11900	12085			
2010-2100	A,S	Voice of Kenya, Nairobi	6100				
2015-2100		ELWA, Monrovia, Liberia	11830				
2015-2100		Radio Cairo, Egypt	9670				
2025-2045		RAI, Rome, Italy	7235	9575	9710		
2030-2055		Radio Polonia, Warsaw, Poland	6095	7285			
2030-2100		Radio Australia, Melbourne	9580	9620			
2030-2100		Radio Beijing, China	6955	7480	9440	9745	
			11790				
2030-2100	A,S	Radio Canada Int'l, Montreal	6030	9555	11945	15325	
			17820	17875			
2030-2100		Radio Korea, Seoul, South Korea	13670				
2030-2100		Radio Netherland, Hilversum	15560				
2030-2100	M-F	Radio Portugal, Lisbon	7155	9740			
2030-2100		Radio Sofia Bulgaria	7115	7155	9700		
2030-2100		Radio Tirana, Albania	9480	11835			
2030-2100		Voice of Africa, Cairo, Egypt	15375				
2030-2100		Voice of Vietnam, Hanoi	9840	12020			
2030-2100		Spanish Foreign Radio, Madrid	7275	9765			
2040-2100		Radio Havana Cuba	15230	15300			
2045-2100		All India Radio, New Delhi	7412	9550	9910	11620	
			11715				
2045-2100		IBRA Radio, Malta	6100				
2045-2100		Radio Berlin Int'l, East Germany	5965	6125			
2045-2100		Vatican Radio, Vatican City	9625	11700	11760	15120	
2045-2100		WYFR, Oakland, California	11830	13695	15170	15566	
			17612	17845			
2050-2100		Vatican Radio, Vatican City	6190	7250	9645		

2100 UTC [5:00 PM EDT/2:00 PM PDT]

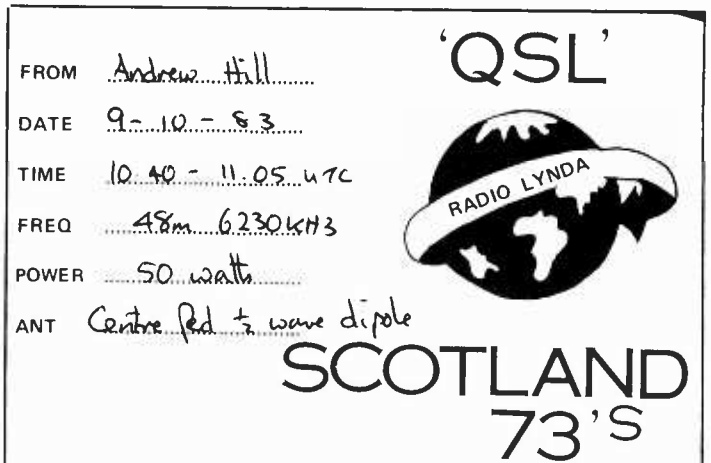
2100-2105		Radio Damascus, Syria	11900	12085			
2100-2105		Radio Zambia, Lusaka	3345	6165			
2100-2110		Vatican Radio, Vatican City	6190	7250	9645		
2100-2110	A,S	Voice of Kenya, Nairobi	6100				
2100-2125		BRT Brussels, Belgium	5910	9925			
2100-2115		IBRA Radio, Malta	6100				
2100-2125		Radio Austria Int'l, Vienna	5945	6155	9585	9870	
2100-2125		Radio Beijing, China	6955	7480	9440	9745	
			11790				
2100-2125		Radio Bucharest, Romania	5990	6105	7145	7195	
2100-2125		Radio Netherland, Hilversum	9540	9715	9895	15560	
2100-2130		Radio Berlin Int'l, East Germany	5965	6125			
2100-2130	T,F	Radio Budapest, Hungary	6110	9585	9835	11910	
			15160				
2100-2130		Radio Japan, Tokyo	5965	7140	7280	17835	
2100-2130		Radio Korea, Seoul, South Korea	13670				
2100-2130		Radio Moscow, USSR	9490	9620	9865	11675	
			11840				
2100-2130		Radio Sweden, Stockholm	6065	11845			
2100-2130		Swiss Radio Int'l, Berne	9885	12035	15570		
2100-2135		ELWA, Monrovia, Liberia	11830				
2100-2140		Radio Havana Cuba	15230	15300	15340		
2100-2145		Radio Cairo, Egypt	9670				
2100-2150		Deutsche Welle, West Germany	9650				
2100-2150		Radio Baghdad, Iraq	9770				
2100-2155		Radio Beijing, China	6860	9470	9860		
2100-2200	M-A	ABC, Alice Springs, Australia	2310	[ML]			
2100-2200		ABC, Katherine, Australia	2485				

frequency SECTION

2100-2200	M-A	ABC, Tennant Creek, Australia	2325	[ML]			
2100-2200		All India Radio, New Delhi	9550	9910	11715		
2100-2200		(US) Armed Forces Radio and TV	15330	15345	15430		
2100-2200		BBC, London, England	3995	5975	6005	6175	
			6180	7325	9410	12095	
			15070	15260	17760		
2100-2200		CBC Northern Quebec Service	9625	11720			
2100-2200		CBN, St. John's, Newfoundland	6160				
2100-2200		CBU, Vancouver, British Colombia	6160				
2100-2200		CFCF, Montreal, Quebec	6005				
2100-2200		CFCN, Calgary, Alberta	6030				
2100-2200		CHNS, Halifax, Nova Scotia	6130				
2100-2200		CKWX, Vancouver, British Colombia	6080				
2100-2200		CFRB, Toronto, Ontario	6070				
2100-2200		(US) Far East Network, Tokyo	3910				
2100-2200		King of Hope, Southern Lebanon	6280				
2100-2200		KSDA, Agat, Guam	11965				
2100-2200	M-A	KUSW, Salt Lake City, Utah	17715				
2100-2200		KVOH, Rancho Simi, California	17775				
2100-2200	A,S	Radio Malabo, Equatorial Guinea	9552.5				
2100-2200	A,S	Radio Zambia, Lusaka	9580				
2100-2200		Voice of Africa, Cairo, Egypt	15375				
2100-2200		Voice of America, Washington	6040	6045	9760	11760	
			15410	15445	15580	17785	
			17800	17870			
2100-2200		Voice of Nigeria, Lagos	15120				
2100-2200		WCSN, Boston, Massachusetts	15390				
2100-2200		WHRI, Noblesville, Indiana	9770	17830			
2100-2200		WINB, Red Lion, Pennsylvania	15185				
2100-2200		WRNO, New Orleans, Louisiana	13760				
2100-2200		WYFR, Oakland, California	9852.5	15170	17845		
2100-2200		WYFR Satellite Net, California	13695	15375			
2110-2200		Radio Damascus, Syria	117651	11900			
2115-2200		BBC, London, England	3995	5975	6005	6175	
			6180	7325	9410	9915	
			12095	15070	15260		
2115-2130		Radio Yugoslavia, Belgrade	5980	7240	9620		
2125-2155	S	Radio Austria Int'l, Vienna	5945	6155	7205	9655	
2130-2145		BBC, London, England*	5965	7160			
2130-2200		BBC, London, England*	6030	7230	9635		
2130-2200		HCJB, Quito, Ecuador	15270	17790			
2130-2200		Kol Israel, Jerusalem	9435	9815	11605		
2130-2200		Radio Canada Int'l, Montreal	11880	15150	17820		
2130-2200		Radio Finland, Helsinki	6120	111745	11755	15400	
2130-2200		Radio Sofia, Bulgaria	9700	11720			
2130-2200		Radio Tirana, Albania	9480				
2130-2200		Radio Vilnius, Lithuanian SSR	6100				
2130-2200		Swiss Radio Int'l, Berne	6190				
2135-2150	S-F	ELWA, Monrovia, Liberia	11830				
2150-2200	M-F	ELWA, Monrovia, Liberia	11830				

Andrew Hill of Cheslyn Hay, England, sent us several interesting QSL's, among them these two pirate stations, Britain Radio International and Radio Lynda! Though they were broadcasting on SW during '83 and '84, he isn't sure if they are currently active.

Below is a card from IRIB (Islamic Republic of Iran Broadcasting). The banner proclaims "War is ugly, but to be dominated by aliens is still uglier!"



frequency SECTION

2200 UTC [5:00 PM EDT/3:00 PM PDT]

2200-2205	M-F	ELWA, Monrovia, Liberia	3993	11830			
2000-2210	M-H	Port Moresby, Papua New Guinea	3925	4890	5960	5985	
			6020	6040	6080	6140	
			9520				
2200-2210		Radio Sierra Leone, Freetown	5980				
2200-2215	M-A	ABC, Alice Springs, Australia	2310	[ML]			
2200-2215	M-A	ABC, Tennant Creek, Australia	2325	[ML]			
2200-2215		BBC, London, England*	5965	7160			
2200-2215	M-F	Voice of America, Washington	9640	11740	15120		
2200-2225		BRT, Brussels, Belgium	5910				
2200-2225		RAI, Rome, Italy	5990	9710	11800		
2200-2225		Vatican Radio, Vatican City	6015	9615	11830		
2200-2230		ABC, Katherine, Australia	2485				
2200-2230		All India Radio, New Delhi	9550	9910	11620	11715	
2200-2230		CBC Northern Quebec Service	9625	11720			
2200-2230	S	KGEI, San Francisco, California	15280				
2200-2230	M-A	KUSW, Salt Lake City, Utah	15580				
2200-2230	S	Radio Norway Int'l, Oslo	15165	15180			
2200-2230		Radio Prague, Czechoslovakia	6055				
2200-2230		Radio Sofia, Bulgaria	9700	11950			
2200-2230		Radio Vilnius, Lithusanian SSR	7165	7400	11790	13645	
			15180				
2200-2245		Radio Berlin Int'l, E. Germany	5965	9730	11965		
2200-2245		WINB, Red Lion, Pennsylvania	15185				
2200-2245		WYFR, Oakland, California	9505	11830	13695	15375	
			21525				
2200-2250		Voice of Turkey, Ankara	7135	7160	9445	17760	
2200-2255		RAE, Buenos Aires, Argnetina	6060	9690	11710		
2200-2300		(US) Armed Forces Radio and TV	6030	15345	15430		
2200-2300		BBC, London, England	5975	6005	6175	6180	
			7325	9410	9590	9915	
			12095	15070	15260		
2200-2300		CBN, St. John's, Newfoundland	6160				
2200-2300		CBU, Vancouver, British Colombia	6160				
2200-2300		CFCF, Montreal, Quebec	6005				
2200-2300		CFCN, Calgary, Alberta	6030				
2200-2300		CHNS, Halifax, Nova Scotia	6130				
2200-2300		CKWX, Vancouver, British Colombia	6080				
2200-2300		CFRB, Toronto, Ontario	6070				
2200-2300		(US) Far East Network, Tokyo	3910				
2200-2300		King of Hope, Southern Lebanon	6280				
2200-2300		KVOH, Rancho Simi, California	17775				
2200-2300		Radio Australia, Melbourne	15160	15240	15320	15395	
			17795				
2200-2300	M-F	Radio Canada Int'l, Montreal	5960	9755			
2200-2300		Radio For Peace, Costa Rica	13660				
2200-2300		Radio Havana Cuba	7140				
2200-2300		Radio Moscow, USSR	6130	9490	9610	9640	
			9665	9765	11710		
2200-2300		SBC Radio One, Singapore	5010	5052	11940		
2200-2300		Voice of America, Washington	15120	15185	15290	15305	
			15320	17740			
2200-2300		WCSN, Boston, Massachusetts	15300				
2200-2300		WHRI, Noblesville, Indiana	9770	17830			
2200-2300		WRNO, New Orleans, Louisiana	13760				
2215-2230		BBC, London, England*	11820	15390			
2230-2300	A,S	CBC Northern Quebec Service	9625	11720			
2230-2300		Radio Beijing, China	3985	6165			
2230-2300		Radio Jamahiriya, Libya	11815	15450			
2230-2300		Radio Mediterran, Malta	6110				
2230-2300		Radio Polonia, Warsaw, Poland	5995	6135	7125	7270	
2230-2300		Radio Tirana, Albania	7215	9480			
2245-2300		All India Radio, New Delhi	6055	7215	9535	9910	
			11715	11745			
2248-2300		WINB, Red Lion, Pennsylvania	15145				

2300 UTC [7:00 PM EDT/4:00 PM PDT]

2300-2315		BBC, London, England	5975	6005	6175	6195
			7325	9410	9515	9590
			9915	12095	15070	15435
2300-2330		Kol Israel, Jerusalem	9435	11605	12080	
2300-2330		Radio Canada Int'l, Montreal	9755	11730		
2300-2330		Radio Mediterran, Malta	6110			
2300-2330		Radio Polonia, Warsaw	5995	6135	7125	7270
2300-2330		Radio Sofia, Bulgaria	9700	11950		
2300-2330		Radio Sweden, Stockholm	9695	11705		
2300-2345		WINB, Red Lion, Pennsylvania	15145			
2300-2350		Radio Kiev, Ukrainian SSR	9640	9800	11790	13645
			15180	15455		
2300-0000		All India Radio, New Delhi	6055	7215	9535	9910
			11715	11745		
2300-0000		(US) Armed Forces Radio and TV	6030	11790	15345	
2300-0000		CBC Northern Quebec Service	9625	11720		
2300-0000		CBN, St. John's, Newfoundland	6160			
2300-0000		CBU, Vancouver, British Colombia	6160			
2300-0000		CFCF, Montreal, Quebec	6005			
2300-0000		CFCN, Calgary, Alberta	6030			
2300-0000		CHNS, Halifax, Nova Scotia	6130			
2300-0000		CKWX, Vancouver, British Colombia	6080			
2300-0000		CFRB, Toronto, Ontario	6070			
2300-0000		(US) Far East Network, Tokyo	3910			
2300-0000	M-A	KUSW, Salt Lake City, Utah	15580			
2300-0000		KVOH, Rancho Simi, California	17775			
2300-0000		Radio Australia, Melbourne	15160	15240	15320	15395
			17795			
2300-0000		Radio Baghdad, Iraq	6120			
2300-0000		Radio for Peace, Costa Rica	13660			
2300-0000		Radio Jamahiriya, Libya	11815	15450		
2300-0000		Radio Japan, Tokyo	11800	15195	17810	
2300-0000		Radio Moscow, USSR	9765	9865	11710	11750
			11780	15245	15425	15475
			17570	17675	17685	17740
			17850	17860		
2300-0000		Radio Thailand, Bangkok	9655	11905		
2300-0000		WCSN, Boston, Massachusetts	15300			
2300-0000		WHRI, Noblesville, Indiana	9770	17830		
2300-0000		WRNO, New Orleans, Louisiana	13760			
2300-0000		WYFR, Oakland, California	5950	9505		
2315-2330		BBC, London, England*	11820	15390		
2315-0000		BBC, London, England	9515	9590	9915	12095
			15435			
2320-2325	M-A	Radio Prague, Czechoslovakia	6055	9630		
2330-2355	M-A	BRT, Brussels, Belgium	9925	11695		
2330-0000	M-A	Radio Budapest, Hungary	6110	9520	9585	9835
			11910	15160		
2330-0000	M-F	Radio Canada Int'l, Montreal	5960	9755		
2330-0000		Radio Korea, Seoul	15575			
2330-0000		Radio Tirana, Albania	6200	7065	9760v	
2330-0000		Voice of Vietnam, Hanoi	9840	12020		
2335-2345	M-A	Voice of Greece, Athens	9395	11645		
2345-0000		BBC, London, England*	3915	6080	7180	9580
2345-0000		Radio Berlin Int'l, E. Germany				
2348-0000		WINB, Red Lion, Pennsylvania	15145			

Send us your special QSLs and we'll copy and return them promptly, to be used as space permits (QSL editor, PO Box 98, Brasstown, NC 28902).

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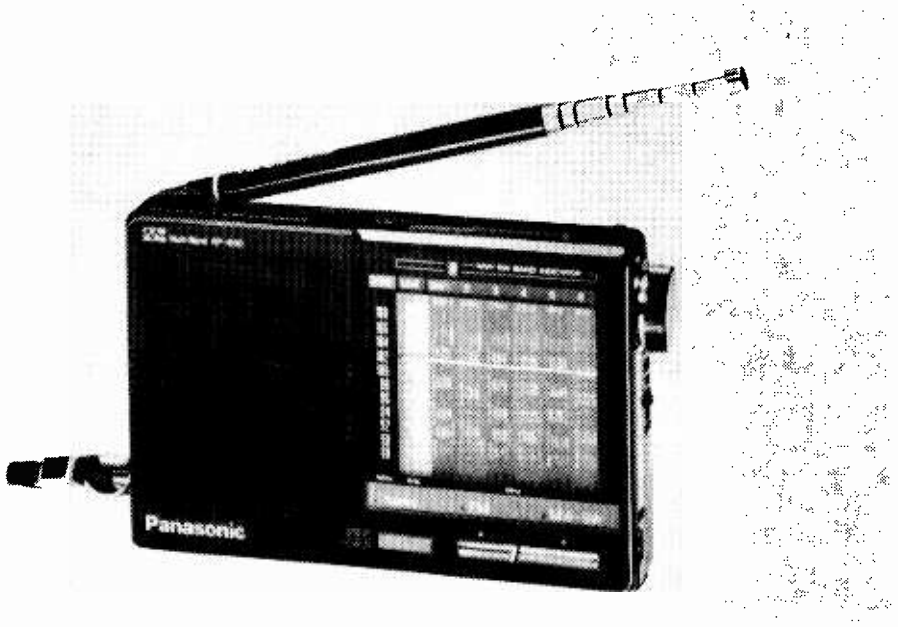
magne tests...

Lawrence Magne

Editor-in-Chief
Passport to World Band Radio



The Panasonic RF-B10

Earlier this year Passport tested the Sony ICF-SW1 and found it to be the best miniature world band portable around. The only problem is that it's priced at a walloping $339.95 in the US. If you're a serious listener or you travel a lot, that's perfectly reasonable. But if you just want a small shortwave set for the occasional trip, something less costly should be all you need to hear news from the major broadcasters.

Compact and Lightweight

Panasonic's little RF-B10 is designed to do just that. It's about the same size and weight as Sony's 'SW1, but at $99.95 you can buy more than three of these for the price of one 'SW1.

The 'B10, like the 'SW1, operates off two ordinary "AA" batteries. Beyond this and physical appearance, the two sets have precious little in common. The 'SW1 is synthesized with digital frequency readout, whereas the 'B10 uses traditional analog circuitry and a needle-and-dial readout. The 'SW1 tunes the entire shortwave spectrum, whereas the 'B10 tunes only certain bands. The 'SW1 is double conversion to keep image interference down, whereas the 'B10 uses less-costly single conversion circuitry. The 'SW1 is fairly selective; the 'B10 isn't.

Limited Frequency Coverage

Let's take a closer look at frequency coverage. The 'B10 covers the AM band, which today runs from 530-1600 kHz. Shortwave coverage is from 5.9-6.3 MHz in the 49 meter band; 7.0-7.38 MHz in the 41 meter band; 9.4-10.1 MHz in the 31 meter band; 11.53-12.2 MHz in the 25 meter band; 15.0-15.8 MHz in the 19 meter band; and 17.4-18.1 MHz in the 16 meter band.

What the 'B10 misses are the 120, 90 and 60 meter tropical bands, plus the 75, 21, 13 and 11 meter international bands. Also, the forthcoming 1600-1700 kHz extension of the mediumwave AM band in the Americas is not covered. Most versions of the 'B10 also cover the worldwide 88-108 MHz FM band, with coverage of the Japanese 76-90 MHz FM band being available only on the version sold in Japan.

That's hardly ideal for the traveler but about what you'd expect from an inexpensive little portable.

As to being able to tell what channel you're tuned to, the bandspreaded analog readout is reasonably accurate. It's not comparable to a digital readout, to be sure, but much better than cheap portables that try to fit several shortwave broadcasting bands within one tuning range. Selectivity is only fair, so adjacent-channel interference tends to be a problem. Sensitivity is also only fair, but probably won't disappoint travelers trying to hear favorite programs from home.

Unpleasant Sound

Unfortunately, there are two significant drawbacks to this radio. First, image rejection is poor. What this means is that various unwanted sounds, such as RTTY, FAX and Morse code, can sometimes be heard mixing in with the station you're trying to hear.

The other problem is that on the first sample of the RF-B10, audio quality was tinny and distorted. This was especially surprising because Panasonic world band radios usually have superior audio.

A second sample of the 'B10, however, produced good, crisp audio with sufficient volume. Still, the speaker on the Sony 'SW1 sounds better. And, with the Sony, you can bypass the speaker altogether and listen on hi-fi earpieces with excellent

stereo sound. The Panasonic operates only in mono using headsets.

Suitable for Travel Use

The bottom line, though, is that for the same price as the 'B10, you can buy one of Sony's cheaper models, the ICF-4920 or ICF-4900 Mark II. This model has much better image rejection and selectivity than the 'B10 and yet is the same size and weight. And if you don't mind traveling with a radio that's just a bit larger, the Philips or Magnavox D1835, which sells in North America for only $69.95, has better audio quality than the 'B10, and covers more of the shortwave spectrum.

So, what we have in the Panasonic RF-B10 is a tiny, low-cost set that's generally adequate for the traveler trying to keep up with news from home. After all, most travelers don't sit around all day listening to the radio, and listening to the 'B10 now and again for news and sports shouldn't bother anybody -- especially when you think of what you could do with the $240 you saved over Sony's fancy 'SW1 offering.

mt

You can hear Larry Magne's equipment reviews the first Saturday night each month over Radio Canada International's popular SWL DIGEST. For North America, it's 8:10 PM Eastern Time on 5960 and 9755 kHz; for Europe, 2008 UTC on 5995, 9670, 11945, 15325, 17820 and 17875 kHz. Larry's "What's New in Equipment" is also featured various other Saturdays throughout the month, while Passport editors Don Jensen and Tony Jones report on world broadcasting the third Saturday night each month.

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Larry Wiland

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The Regency Informant 1 and 2

Regency's Informant series of scanners have been on the market for some time. They remain a radical departure from the scanners most of us are familiar with. The big difference between the INF-1 and INF-2 mobile units and the standard scanner is that on the Informants, the manufacturer has pre-programmed in the frequencies for you. Coverage includes the 36-47, 150-163, and 450-462 MHz bands and there are a number of services in these ranges that are of interest to the "serious" driver. Still, they are pre-programmed -- you get what you get and there ain't no more.

Both radios do have Regency's hot "Turbo-Scan" feature that allows them to search frequency bands at a rapid 40 channels per second. That's fast -- the fastest in the industry in fact.

The INF-1

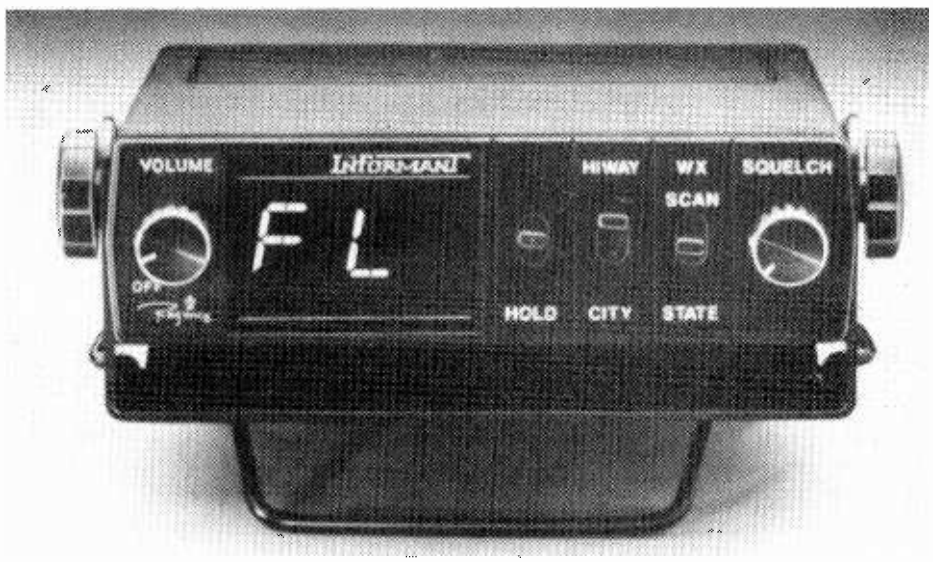
The Informant 1 (INF-1) is basically designed for the individual who wants to monitor state and local police channels. The user simply selects the state in which he is traveling and the radio will scan the manufacturer's preprogrammed frequencies for that state. Each of the 50 states are represented.

A two-character, two function digital display first shows the state selected (for example, Ohio is OH, Pennsylvania is PA, etc.), then rapidly flashes to show the user the scanner is actually searching and, when a frequency is received, displays a 2-digit character that indicates the service on the frequency. "SP", for example, means "State Police." When the transmission is over, the unit reverts back to the state mode (flashing the 2-digit state abbreviation). The sequence repeats indefinitely.

Another toggle switch allows selection between either state or local police channels. Unfortunately, both cannot be monitored simultaneously. This reflects its initial market for which it was designed -- the trucking industry. This necessitates toggling back and forth between the "city" and "highway" positions. However, since there is no direct frequency readout, it does make it easy to figure out what you are hearing.

Instant Weather

Two very handy features are the "instant weather" and the "hold" features. With the instant weather, you need only flip the "WX" switch and the radio scans all current NOAA weather channels in use, stopping at the one in use in your area. The "hold" works like the "manual" button on a standard scanner, allowing you to stop the scanner on a particular frequency of interest. Another flip of the hold switch and the unit will once again scan.



The Informant series (now being discontinued) -- a good idea that could have used more testing

Locking Out Birdies

But what if you want to lock-out an annoying birdie channel or those not of interest? It can be done, but no switch is provided. To do so, you must do the following for each channel to be locked-out: First, flip down and hold the "hold" button, and while doing so, flip down and also hold the "state" button. Next, release the "hold" button, and *then* the state button. The frequency is then removed from the scanning sequence.

You must do this for each frequency you wish to remove and each channel must be locked-out in this manner *every time the scanner is turned off and then reused*. The procedure does get easier with practice and fortunately, the radio has few birdies. All told, you can lock-out a total of 20 channels.

The INF-2

Incorporating all the features of the INF-1, the Informant 2 has a few unique features of its own. The most notable is "service search." This scanner not only has preprogrammed police and state police frequencies in the memory, but also has fire, emergency road services, medical services, amateur radio, weather alert and a special weather priority feature as well.

Plus, unlike the INF-1, you can search any or all of the services at the same time, without having to toggle a switch between "city" and "highway." A 50-channel "list" (memory) can also be compiled by toggling a "save" switch which enters them into a separate memory. The memory can then be scanned at the user's convenience.

Auto Save Feature Saves Time

The radio also has an "auto-save" feature. Similar to the "save" switch, activating this feature allows the scanner to compile its own list of active channels by memorizing any and all active channels encountered during the search sequence. The radio can thereby compile a 50-channel active frequency memory for the listener without user assistance! A "delete" switch on the front panel allows lock-out of uninteresting channels from both the regular scan sequence or the user-compiled memory.

The INF-2 is a weather buff's dream. It not only finds the NOAA channels in use in an area automatically for the user, but it also

features "weather alert" and "weather priority."

Weather alert allows the user to set the radio up like the storm-warning radios most are familiar with. This feature can only be used when the radio is off. It sounds an alarm when the National Weather Service activates their tones during severe weather conditions and then plays the forecast when the radio is turned on. Although an excellent feature, it cannot be used while the radio is in operation.

The weather priority, on the other hand, overrides all other scanner traffic to alert the user of impending severe weather.

The Good...

Both radios are user-friendly in an odd sort of way. They exhibit very good sensitivity when used with a good mobile scanner antenna and allow the reception of various frequencies automatically, without having to look them up and punch them in, when traveling in an unfamiliar area or somewhere distant from home.

Not only does this feature eliminate the need for carrying around a frequency directory when traveling, but it also does away with the need to reprogram one's scanner each time you travel from one area to the next -- the radio does the thinking for you.

Audio is very strong and clear on both, and all controls are easy to operate, even should the need arise while the vehicle is in motion. Both scanners come with a cigarette lighter cord, mounting bracket/visor clip, a telescoping antenna, and easy-to-understand directions. With the addition of a 12 volt, 500 ma power supply, the INF scanners can even be used as base units. For example, you might want to monitor local activity while overnighting in your motel.

The LED display (green) is easy to see in daylight and darkness, and the compact size of both units (about the size of a CB radio) allow mounting in tight spots. Both the volume and squelch controls operate freely and are sensitive to user "input."

...The Bad

The most serious shortcoming of the INF-1 is the "Trucker's English" that is used to abbreviate the the various services being received. Local police traffic displays as "CM" (County-Mountie -- no kidding) and state police aircraft displays as "BA" (Bear-in-the-Air). Ain't that jus fahn, gud buddy? Luckily, the INF-2 recognizes that not everyone with a scanner wants to be treated like a fool and uses more fitting abbreviations, such as "LP" for local police.

The INF-1 also has no true memory designed into it. That is, each time the radio is used, any uninteresting channel must be locked out. This is true even though the radio must be connected to a constant source of 12 volt power.

Also, sometimes the scanning sequence will stop because of interference or an open mike and the unit halts scan abruptly. The problem is that the only indication listener that this has happened is a long period of silence. The offending channel must then be locked out. Otherwise, the INF-1 suits its intents and purposes well.

The INF-2, on the other side of the coin, is a "noise generator." Both radios suffer interference from strong RF signals such as on-board computer ignition systems and computers in nearby banks and offices. Also, it seems as though the more services one adds on to the "scan list" of the INF-2, the more noise and locked-out channels it produces. Even after all the offending channels are thought to be locked-out, they continue to "pop up" at random.

The INF-1 -- perhaps due to its lack of multiple services -- seems less prone to this problem. Perhaps the radio's plastic cabinet contributes to the problem. A metal cabinet may have helped here.

Both radios have a bit of intermod with the INF-2 once again winning the round. The problem is not a tremendously serious one but can become annoying at times. Something to consider at the time of purchase, however.

Overall Thoughts

All in all, the Informant 1 and 2 are a very good idea but should have been tested more thoroughly before being released to the public. INF-1 (aside from the CB linguistic readout) is a practical and useful tool for the serious driver. The INF-2 suffers from serious noise problems and appears to have no remedy available for it. The INF-1, though, was able to be quieted by locking-out only 2-3 channels.

Regency Electronics (now part of Uniden Corp.) has announced discontinuance of the Informant series scanners, which has caused a dramatic drop in pricing. This makes the INF-1 a real bargain at current pricing (anywhere from 30-50 percent less than original consumer cost) and makes them very attractive. The INF-2, however, should be avoided at any cost.

The INF-1 and 2 dimensions are 1 3/8"H x 5"W x 6 1/2"D, and both are powered by 11-15 volts DC (standard automobile current or, via a wall-mounted transformer should base use be desired).

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Options On the IF

The IF (intermediate frequency) bandwidth of your receiver is determined by the "Q" of the circuits, IF transformers (cans), ceramic or crystal filters and the number of them. The better they are, the narrower the width. A *perfect* receiver would have specs of 500 Hz. at 6 dB., 1 kHz at 60 dB. for CW (code), 2.4 KHz at 6 dB., 3.1 kHz at 60 dB. for SSB and 4 kHz at 6 dB., 4.7 kHz at 60 dB. AM. I say perfect in the realm of the possible. The ideal receiver would have no differential at all. As it is, the figures stated are just shy of a million to one.

The most expensive single component -- sometimes

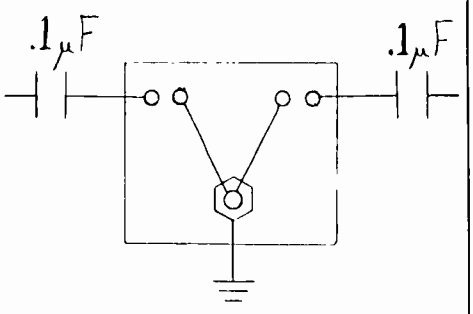
In a ham transceiver, the crystal filter is the most expensive single component. Unfortunately, in a shortwave listener's receiver, the filter is no more expensive than an IC or other discrete part, usually about 3 to 5 dollars. If you think the manufacturers believes you will never know the difference, you're right! They also want the sets to be easy to tune, damn the interference.

Now to read it. If your receiver uses an NTK LFC-3 -- rather common -- this means the bandwidth is 3 kHz at 3 dB. (half an "S" unit) and about 12 kHz at 50 dB. The Murata CFU-455H is the size of a child's game dice (as opposed to the NTK which is about 1/3 the size of a domino). It's specs are roughly the same, except it "mushes out" to around 15 kHz. The CFW units are twice the size of the CFU and are a bit tighter.

I think you know what I'm going to say. The smaller the number and higher the letter, the tighter the filter. For instance, an LFC-2 or a CFU/CFW I cuts the width almost in half and you don't lose anything except your interference. All you need is solder wick and a steady hand to replace the unit.

Ike Kerschner's dual crystal filter modification on page 80 of the February, 1988, *Monitoring Times* is an excellent way to go for those with older tube type and inexpensive solid state radios such as the DX-150. Otherwise, one needs to go for a ham/commercial grade filter which sells for $100.00 UP.

Fig 1: Filter Installation



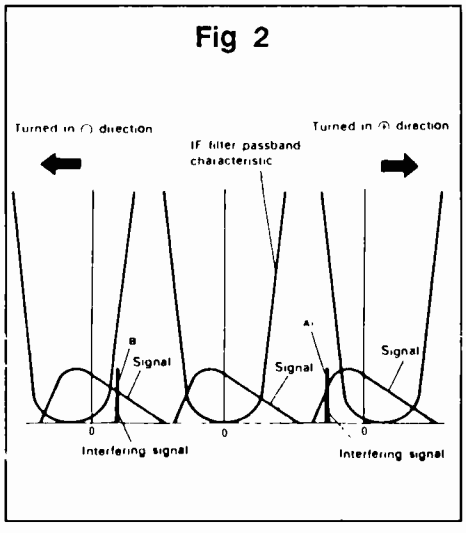
Filters are available

Such filters can be found at Fox Tango, P.O. Box 15944, W. Palm Beach, FL 33406 in the FT-44A. This is an 8 pole crystal unit at 455 kHz, made for the Icom R-71A after market. The specs are 2.4 kHz at 6 dB. and 3.1 kHz at 60 dB. This is about as close to a doorway as you'll ever get. The filter is large, about 2"x1"x1" and will *not* fit in a small portable. Suggested installation for universal application is shown in figure 1.

Passband tuning, or "IF shift" is a simple way to run around and pick and choose the one of several signals present in the IF strip. It's somewhat frequency dependent in that the technique works better at an IF frequency above 455 kHz.

Figure 2 shows what may be expected and figure 3 is a common circuit in the first IF. It uses a varactor diode in the secondary of the IF transformer and the coupling to the next stage is done via the capacitor. This creates a "peaking" effect, shunting the unwanted area to the side. Another way to go is with a "Q multiplier."

Fig 2



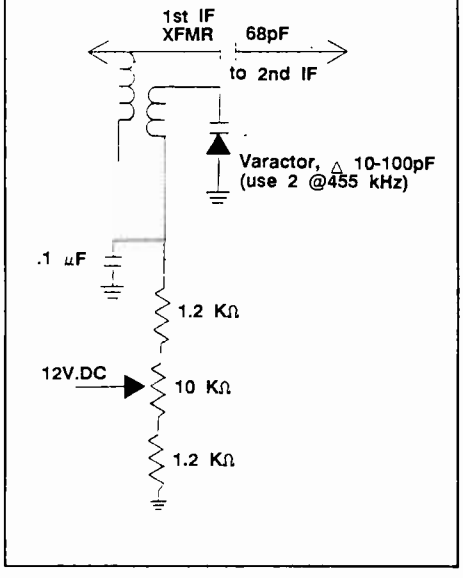
This is a high gain circuit attached to the IF that boosts the "Q" factor by several thousand before it goes into oscillation. Heathkit made a good one for many years, but stopped in the 1960s. God only knows why, as it is a cheap and clean way for a quantum improvement. Parts placement is critical and in all of my "cookbooks" I couldn't find an easily duplicable circuit. In other words, I don't need a hundred letters telling me that "all it does is squeal."

I intend to work on the problem, and if anyone has a good circuit and is nice enough to send it to me, they'll sure get all the credit when I write it up!

To summarize, selectivity is the factor to describe the bandwidth, or "window" your receiver will accept. If it is very wide, it lets the whole crowd in. On the other hand, if it is narrow, you only hear the signal you want, presuming there isn't another station on the *same* frequency -- then, it's tough.

Enjoy. SASE for questions, please.

Fig 3



Ever wish you could put together a simple reliable useful power supply from junk or surplus parts? Clay Ellis offers you just such a one-evening project!

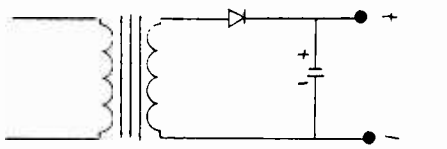
QUICK POWER

by C.W. Ellis

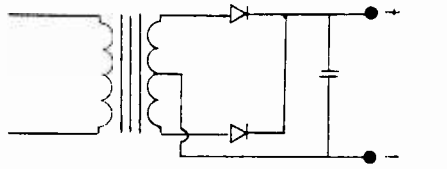
How many times have you looked over the construction plans for a project only to discover that you didn't have the parts for the power supply? Or perhaps you just finished your own breadboard for a new circuit, checked it all out with a bench supply, and now you need to build a supply to finish the design.

What follows here is a quick review of the various common power supply circuits and regulators, along with the information on getting the output you need with the parts on hand. As we go along, I'll try to point out some pitfalls and fine points that can make the difference between power and fire.

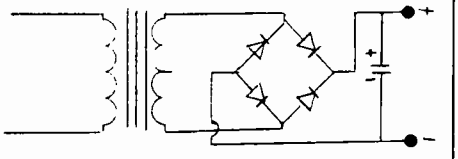
Figure 1



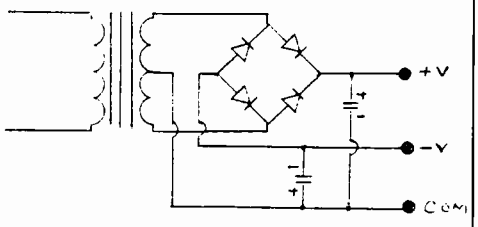
Half Wave



Full Wave



Bridge



Tapped Bridge

Developing the DC

Figure 1 shows the various rectifier circuits most commonly used in low power supplies. The half-wave circuit at the top is the simplest and lowest cost rectifier circuit compared to the remaining three. This circuit's only advantage is that it uses but one diode. Its shortcomings are many; high ripple voltage, large no load to full load variation in output, and inefficient use of the transformer.

It is used to power circuits such as indicator lights, relays and other devices that do not require regulation. The no load output voltage is approximately .7X the transformer output voltage, and rated transformer current can be drawn from the supply.

The second rectifier circuit uses one more diode and requires a center tapped transformer it is called a full wave rectifier. The full wave rectifier uses both halves of the AC cycle and supplies current to the capacitor all the time whereas the half wave rectifier uses only one half of the cycle. The full wave circuit produces lower ripple voltage and efficiency is much improved over the half-wave.

The third circuit is the bridge rectifier. Ripple and efficiency is equal to a full wave circuit. The bridge circuit produces output voltage approximately 1.4X the transformer output and .7X rated transformer current can be drawn.

Rule 1: For a given transformer secondary, (assuming a center tapped transformer) a full-wave circuit gives half the dc output of a bridge circuit.

This means we can vary the dc output of a given circuit by choice of rectifier circuit. Which gives us rule 2.

Rule 2: When buying, salvaging, or winding transformers, those with center tapped windings are more useful as they allow both full-wave and bridge circuit use.

Another use of the bridge circuit is illustrated by the last drawing of figure 1. This circuit produces two outputs, each equal to a full-wave circuit but of opposite polarity. A close look reveals the bridge circuit is made up of two full-wave circuits sharing the same transformer winding, but with the diodes in one circuit reversed to give a negative output.

There are other circuit configurations, which we shall touch on later, but for now we can sum up thus: a center tapped transformer can be utilized in any of three ways to vary the dc output voltage according to need.

Regulating the DC

With any power supply ripple will be lowest and voltage highest under a no load condition. As load is increased ripple will increase and voltage decrease (not a good thing for a power supply to do). To eliminate the problem we will use a device called a regulator.

For our purposes we will concentrate on devices called "three terminal regulators". These are integrated circuit devices (IC's) which are quite easy to use. Workhorse of the three terminal regulators is the LM309, a 5 volt 1 amp device. Figure 2 illustrates how most three terminal regulators are wired.

The capacitor on the input of the regulator is normally the same capacitor shown on the output of the rectifier circuits in figure 1, unless the regulator is placed physically some distance away from the rectifier circuit. A second capacitor is placed across the regulator input if this is the case.

Many circuits use only one capacitor on the regulator output, usually from 10 to 100 mfd., to improve response to changes in load. It is a common practice to parallel this capacitor with a small (.01 mfd.) ceramic capacitor for noise reduction and transient response.

Figure 2, bottom drawing shows the same circuit in a variable supply. The most common regulator IC for this circuit is the LM317. Both ICs process the raw DC with very little ripple and noise.

When using regulator ICs bear the following in mind.

1. Use as big a heatsink as practical for the regulator IC.
2. Use thermal conductive "heatsink compound" when mounting regulator ICs.
3. At maximum load, the raw DC input to the regulator must remain at least

Figure 2

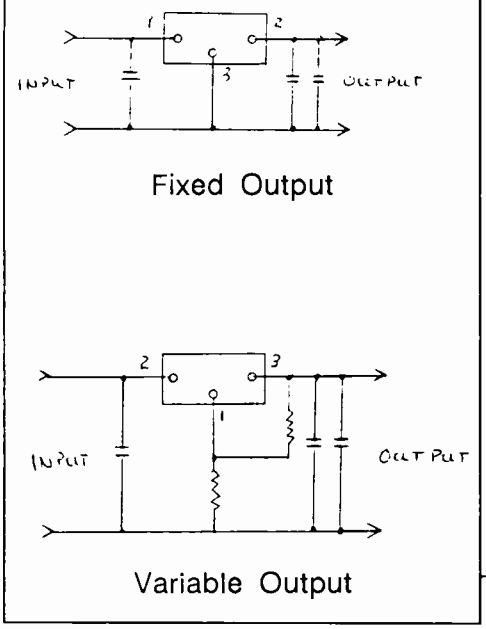
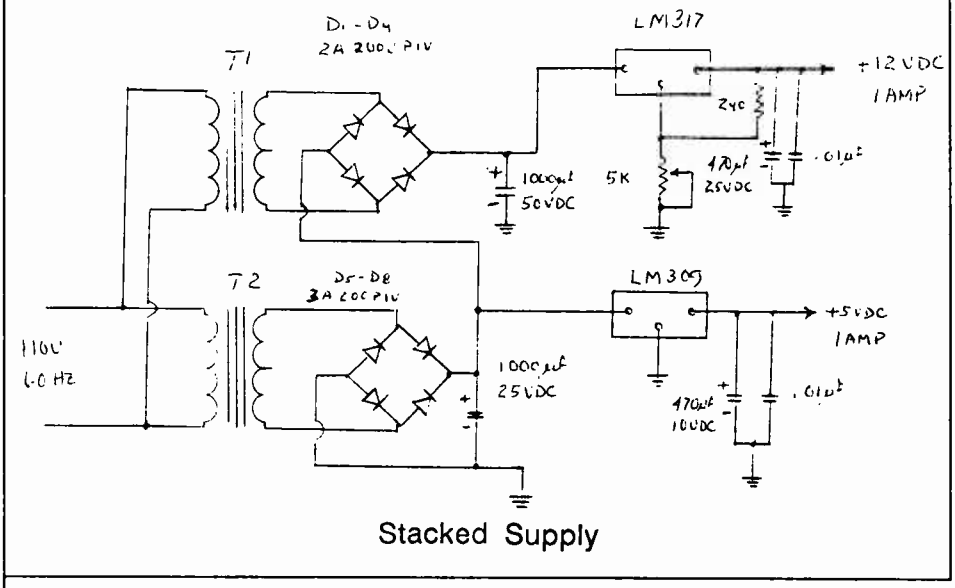


Figure 3



three volts above the rated output voltage.

4. Raw DC input greater than the 3 volt + rated output only contributes heat and does nothing for regulation.

Actual supplies

Figure 3 shows a dual power supply capable of putting out five and twelve volts, it also illustrates the concept of stacked supplies. The raw DC for the LM317 is stacked on the raw DC that feeds the LM309.

This is a legal design and works as follows: Transformer T2 is chosen with an 8 volt ac output; which gives about 11 volts of dc to feed the LM309. T1 is identical to T2, and the rectifier output is again 11 volts dc. However, the minus or return side is connected to the + 11 volts of T2's bridge, and adds to it to give 22 volts at the input of the LM317.

Stacking voltages are useful in situations such as when a 16 volt transformer for the LM317 can not be found. In like manner, the ground terminal on a three terminal regulator can be returned to a dc voltage instead of ground to achieve a higher output voltage. When an IC regulator is stacked on another dc voltage, that voltage should be a regulated voltage, not a raw dc rectifier voltage.

Rule 3: When stacking voltages, remember that the bottom voltage in the stack must handle not only the current for its load, but the current for the load of the supply above it.

TRANSFORMER SELECTION

DC OUT	RECTIFIER	TRANS VOLTS	TRANS AMPS
.7X TR	FULL	DC/.7	1.3 X DC
1.4 X TR	BRIDGE	DC/1.4	1.8 X DC

REGULATOR SELECTION

VOLTS REQD.	RAW DC INPUT	DC AMPS REQD.	+REGULATOR	-REGULATOR
5	+8-15	1	LM309	
5	+8-15	1.5	LM340-5	LM320-5
12	16-30	1.5	LM340-12	LM320-12
15	19-35	1.5	LM340-15	LM320-15
5	8-15	3	LM323	LM345
2-30	5-35	1.5	LM317	LM337
2-30	5-35	3	LM350	
2-30	5-35	5	LM338	

What this means in terms of Figure 3 is that the transformer T2 and its bridge circuit must be capable of 2 amps, as it will supply 1 amp for the LM309 and 1 amp for the LM317. If regulator ICs are stacked, the bottom regulator will also have to supply current for its load and current for the regulator above it.

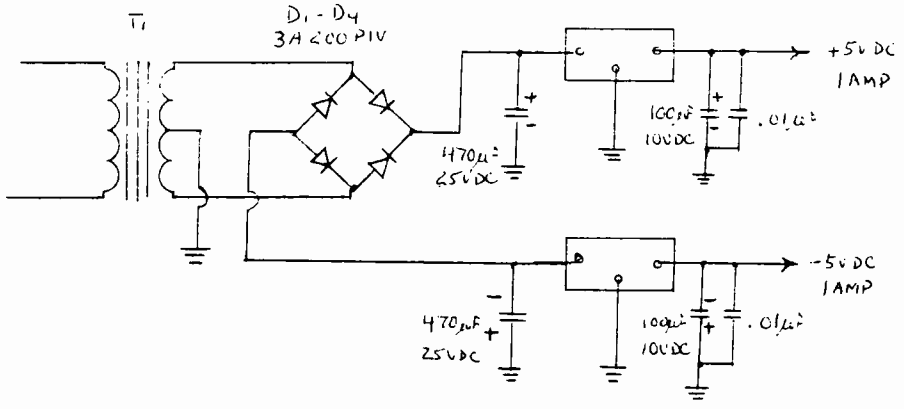
Transformer currents

Now that we know how to develop the voltage desired, we must figure the current ratings of the components. *Most* construction projects power needs can be handled by a supply of 1 to 5 amp capacity. At the end of the article is a chart describing various regulators for building fixed and variable supplies in the 1 to 5 amp range. See above chart for how you can determine the size of the transformer for a given current.

Hints and kinks

If your power supply doesn't regulate at high loads check to the input of the regulator to be certain the input voltage is a minimum of 3 volts above the rated output. If it lacks only a volt or so, try adding a 200mfd. capacitor to the regulator input. This will some-

Figure 4



Dual Supply

times raise the input voltage enough to get by at maximum load. Don't get carried away adding capacitance tho-- see next hint.

If the fuse in the primary (you did include one, didn't you?) tends to blow on turn on, the input capacitance to the regulator may be too big. Try a slo-blow fuse. Do not exceed three times the transformer volt/amp rating with a standard fuse, or 1.5 times the volt/amp rating with a slo-blow.

If the regulator runs hot at rated load, increase the heatsink size, or reduce the input voltage to the regulator but not below 3 volts greater than the rated output. Sometimes both may be required.

For convenience, use diode bridge packages instead of individual diodes. Diode current ratings should be three or more times the regulator current rating. Diode voltage ratings should be 200 PIV or more for any supply in the 2 to 30 volt range.

Use Tantalum capacitors where long life is important, or where low ripple and noise are desired.

Zener circuits

Quick power would not be complete without the mention of Zener regulator circuits. Figure 5 illustrates simple zener circuits for both positive and negative voltages.

Zeners shine in places where a voltage different that the main supply voltage are needed at low currents. Perhaps a bias voltage is required, or one TTL chip must be added to a circuit and +5 volts is not available. In such cases a zener circuit takes little space and is easy to design.

The zener itself is selected to give the desired voltage, and a dropping resistor is used to limit current. Simple Ohms law calculations supply the resistor size There are two voltages involved, and one current. Vbulk is the supply voltage which will supply the zener and will always be higher than Vzener, which is the output voltage. There is a minimum zener current, which is the zener current at full output load, and maximum zener current which occurs at no load conditions.

The calculations are as follows:

1) Subtract the zener (output) voltage from the bulk voltage. This is the voltage across the resistor.
2) Determine maximum current the load will draw.
3) Add 20% to this current. This is maximum zener current.
4) Multiply maximum zener current by rated zener voltage. This is the size of the zener in watts. Use the next higher zener size if it falls between standard sizes.
5) Determine resistor value by dividing the resistor voltage from step 1 by the zener current of step 2.
6) Determine resistor wattage by multiplying resistor voltage from step by zener current of step 3. Use next higher standard value.

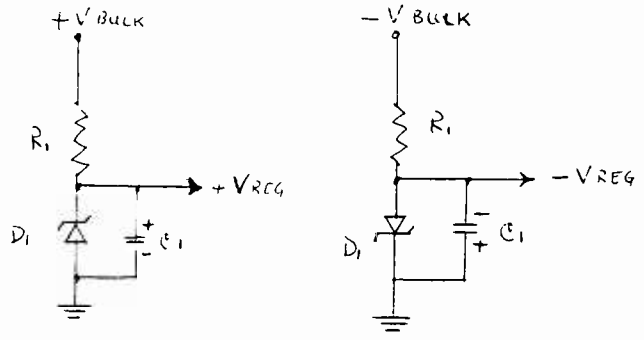
For example: We have a 12 volt supply in an instrument to which we want to add a circuit requiring 8 volts at 30 milliamps (.030 amps).

1) 12v - 8v = 4 volts, the resistor voltage.
2) Already stated - .030 amps load.
3) 120% of .030 = .036 amps, max load.
4) 8v x .036 amps = .288 watts or 288 milliwatts. A 500 milliwatt zener is needed.
5) 4 volts divided by .036 amps = 111 ohms. A standard 110 ohm resistor will work fine.
6) 4 volts X .036 amp = .144 watt, use a 1/4 watt resistor.

Wire the resistor and zener as shown in figure 5, and bypass it with a 1 mfd. capacitor, and you have an 8 volt regulated supply at 30 milliamp capacity for your added circuit. Zeners come in many sizes and wattages, from 1/4 watt to 50 watts, and from 2 volts through several hundred volts. Regulation is almost as good as the IC regulators in many cases, and cost and complexity is much less.

Should you have any questions concerning this article, I will endeavor to answer them directly provided your letter is accompanied by an SASE -- More power to you!

Figure 5

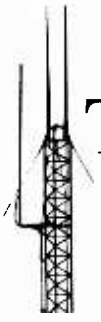


Zener Regulators

antenna topics

W. Clem Small, KR6A, CET

Rt. 1 Box 64A
Weybridge, VT 05753



The ups and downs of the antenna business

My friend Al and I are speaking to each other again!

It's not like we had a fight and stopped talking to each other. It's just that I moved a while back, and the Yagi-Uda beam that I told you about in this column last year had to come down. I used to use that beam to talk to Al and the other hams in Burlington, something like 30 to 40 miles from my home.

I never did get that beam back up and my handheld two-meter transceiver with its rubber ducky antenna just couldn't make it through the Burlington Area Radio Club's repeater to talk to the fellows up there. Even a 5/8 whip on the handheld wouldn't get the job done.

Sweet Success

But behind my house are some maple trees, just right for putting up tall antennas. Incidentally, we made maple syrup from their sap this season, and it is delicious. And making syrup is more work than mounting most antennas. At any rate, these trees must be 60 or so feet tall.

I took a wrist-held, rubber-powered, slingshot and a spool of monofilament fishing line, and shot a weight over a high branch of one tree near the window of my room. Using the monofilament, I pulled up a heavy nylon cord, and used the cord to pull up a coaxial colinear antenna. When the colinear's top was about 30 to 40 feet above ground, Al could read my signals, but not very well. Sometimes he could not understand what I was saying.

Moving Up in the World

Choosing a higher branch for my next shot, the antenna's top was hauled to the 50 to 60 foot level. At that height, my signals come in quite well in Burlington. Neither Al nor I have S-meters on our two-meter gear, so all we can do to evaluate signal strength is to note improvements in loudness of signals if they are weak, or we can note the degree of quieting of the white background noise caused by a signal as it comes from the repeater. Using these criteria, it would seem that the approximate doubling in height of my antenna certainly made a worthwhile increase in signal strength. The signals are now sufficiently loud, and there is not too much white noise.

Enjoying the use of this antenna reminds me of the fact that an appropriate antenna can often give you good communications where you had none, or only poor quality communications before.

A Special Kind of High

While I am on the topic of antenna height, let's review a few of the rules-of-thumb which help us appreciate the value of elevating our skywires. Of course, there's the hydrochloric acid antenna rule (HCL) we've cited before: H for "high", C for in the "clear," and L for "long."

Recently, *Business Radio* carried some notes on how tp give your signals a boost. One of them said that by increasing your antenna's height by 50 percent, you would get a a 3 dB boost to your signal. Jim Kile, in his *VHF Antenna Handbook*, writes that to have effective communications, old timers were forced to follow the rule: "The higher the better. They even had a rule of thumb for it -- doubling antenna height adds 6 dB of signal strength." Going on, he states that, "The old rule still holds valid."

Marconi, the father of radio, put it a different way. He found that by doubling the height of the antenna, the range of possible communications was increased four times!

The Real Lowdown on Antennas

So, if the idea of mounting antennas really high is so important, why do we sometimes have antennas, like the popular "snake" antenna, that is laid on the surface of the ground? Or, worse yet, sometimes even laid under water or buried under the ground? Won't this destroy their ability to receive signals?

Well, at some frequencies, like VHF and above, yes. Even in the upper portions of the HF band, underground antennas are not likely to perform at all well. However, I have seen a number of reports of underground and underwater antennas used on the frequencies from two MHz and down. Some were even at higher frequencies. But, to be very frank, it seems most likely that, even at low frequencies where some significant amount of signal is known to penetrate the earth, they would not be expected to perform as well as antennas mounted high and in the clear, far above the ground.

But the point is that they often do work! And sometimes they work well enough to be useful antennas. I have used antennas laid on the ground, and been surprised at

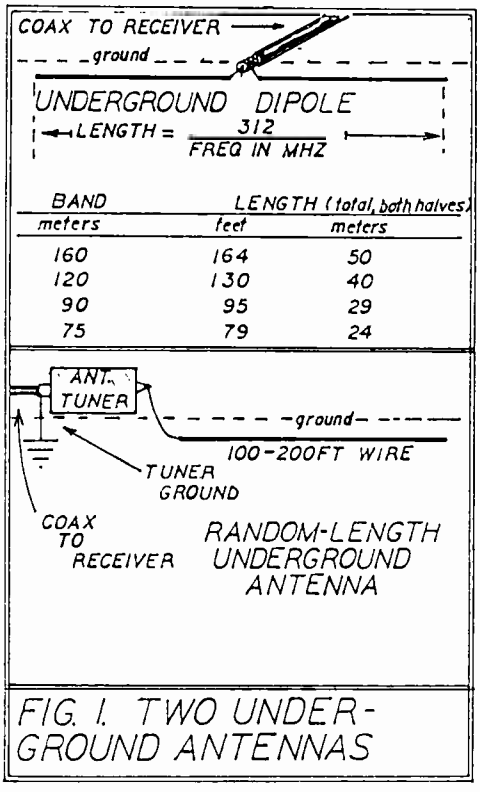


FIG. 1. TWO UNDERGROUND ANTENNAS

their performance, considering how low they were.

Underground and related-type antennas do have their virtues. They are, for instance, much less susceptible to lightning and wind damage. They are invisible, and thus don't compete with the natural scenery. In addition, they require no tall towers to mount them. As a bonus, underground antennas are said to be less noisy than above-ground antennas. Finally, they are 1/3 shorter than conventional antennas, so you can put your antenna into a smaller space.

Selling Ice Boxes to Eskimos?

Am I trying to sell you on an underground antenna, even when you can mount yours above ground? Not really, but it is worthwhile to consider them in some situations. If you feel that you'd like to experiment with one, check out the two variations in figure one.

Use well-insulated wire, and insulate the ends and any joints well. Make them watertight. If you decide to bury the antenna, rather than laying it on the ground, it's easy to put the antenna a couple inches deep, a few inches at a time. Just pry open a slit in the earth with a spade and insert a few inches of antenna. Remove the spade to let the earth close and insert the spade again a few inches down the line. Open the earth a bit and insert a few more inches of antenna.

If you try one, let me know what results you get. I've heard that some people have used them for DX successfully. Their low noise level helps in that, no doubt.

RADIO RIDDLES

Last Month: Well, as you may have noticed, we've gotten into last month's radio riddle already. I had asked, "If the old radio operator's rule about mounting antennas high and in the clear for good reception is true, how can it be possible that we hear of antennas which are effective when mounted on the ground, underground or even under water?"

Well, when a radio signal encounters the earth, some of it may be reflected upwards, some of it may be dissipated as heat, but some of it may also enter the ground. Antennas beneath the ground can receive this energy, and, if it is at a sufficient level, communications can be supported by such waves. At the very low frequencies and lower, submerged submarines routinely receive radio messages via their submerged antennas. The signal level is not high, to say the least. But reliable worldwide communications are possible.

This Month: We say that signals on the VHF and UHF bands follow a line-of-sight path from transmitter to receiver. Is this really true, or is the radio "line-of-sight" actually something different from the optical line-of-sight which we know from our visual experience?

Check in again next month for the answer!

ask bob

Bob Grove, WA4PYQ

P.O. Box 98
Brasstown, NC 28902

Q. What is meant by "image interference" or "image reception"? (J.W., Banning, CA)

A. All modern shortwave and scanning receivers utilize a basic design called "superheterodyne," a process which uses an oscillator to generate a weak signal which mixes with the incoming signal frequency. This process generates two new frequencies, the sum and difference of the two original frequencies.

One of those two new products becomes the intermediate frequency (IF); the other is unwanted and is suppressed as much as possible to keep it from interfering with other desired frequencies which may be received. That unwanted frequency is called the image.

It is desirable to design the receiver so that the image frequency will occur outside the desired tuning range of the receiver. In Bearcat scanners the image frequency is usually removed by either 21.6 or 21.7 MHz, and in Regency and Radio Shack scanners, 21.4 MHz, thus often allowing signals from the 134 MHz aircraft band to be heard in the 155 MHz police band.

The presence of images may be useful to hear signals outside of the design limits of a scanner. For example, early scanners which did not cover the 406-420 MHz federal government range could still monitor the communications by tuning in their images. Presently, even though cellular frequencies are locked out on many 800 MHz scanners, their signals are easily (but unlawfully) monitored on their higher image frequencies.

BC200/205XLT CELLULAR RESTORATION

NOTE: ***It is unlawful to monitor cellular telephone conversations. It is possible to monitor signals from the deleted ranges even without conversion. Simply add 21.7 MHz to the deleted frequency and enter the higher (image) frequency. Reception is virtually identical in strength to that which would be heard on the deleted frequency.***

The frequencies deleted at the factory may be restored, but the procedure must not be attempted by anyone unfamiliar with electronic circuitry. Monitoring Times assumes no liability for damage caused by this procedure. The modification will void your warranty.

Tools Required: Small Phillips screwdriver, small wire cutters.

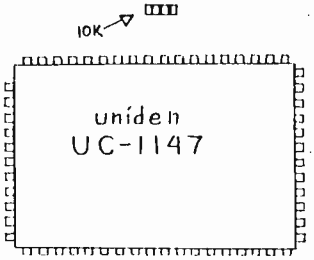
1. Slide off the battery pack and remove the antenna from the scanner.

2. Using a small Phillips screwdriver, remove the two screws from the back of the scanner, the two screws which hold the battery retaining spring at the base and the spring itself.

3. Carefully pry the bottom of the rear cover from the radio and remove the cover.

4. Locate two small screws at the base of the circuit board and remove them. Gently pull the front panel from the mainframe at the base and separate them.

5. Consulting the illustration, locate the microprocessor IC labelled "UNIDEN UC-1147" and the 10k ohm (brown-black-orange) leadless resistor positioned above the letters "DEN" on the IC.



6. Using miniature wire cutters, cut the resistor body in two without disturbing anything else near it. If the left solder pad comes loose it may be peeled from the board. Brush or blow away any residue. This completes the restoration.

Reassembly:

7. Insert the top of the front panel into the slot under the volume/squelch control panel and, noting carefully the alignment of the dual-inline connector at the bottom of the board with the mating socket, press the front panel firmly into place. Be sure that the holes at the bottom of the circuit board line up with the holes in the plastic standoffs below them. Insert the two screws and gently tighten them.

8. Replace the back cover by inserting the top of the cover into the slot under the volume/squelch control panel; press the cover into place, insert and tighten the screws.

9. Reposition the battery retaining spring (slotted side toward notched hole), insert the two remaining screws and gently but securely tighten them.

10. Slide the battery pack into place; switch the scanner on to make sure the display comes on. If not, the battery is discharged or the dual-inline connector was misaligned during assembly (see step 7).

Assuming the display comes on, press: MANUAL, 845.0, E; within two seconds the frequency 845.000 should appear on the display.

Q. When I try listening to my receivers I am troubled by a loud buzzing sound every 15 kHz on my shortwave and by television audio on my scanner. What can I do? (C.S., Auburn, NY)

A. The malady you report is very common. The 15 kHz-interval buzzing comes from the horizontal sweep circuitry of a nearby TV set and the television audio is being radiated from its IF circuitry, probably in the 42 MHz range. Some TV sets are worse than others.

To determine whether the interference is coming from the TV antenna, disconnect that antenna from the TV and see if the interference is reduced; if not, it is probably radiating from the set itself and the power cord.

First, be sure that your receiving antennas are moved as far as possible from the TV and its antenna. Next, install an adequate ground wire between all of your receiving equipment and an actual ground (cold water pipe or 8' ground rod in moist soil). The installation of interference chokes on all cables (TV and radio equipment) is strongly recommended.

Additional measures would include installing RF bypass capacitors on the TV line cord, notch or bandpass filters on the antenna lines, and shielding the TV chassis itself.

An excellent guide for this type of troubleshooting is the *Interference Handbook* by William R. Nelson ($9.95 plus $1 shipping from Radio Publications, Box 149, Wilton, CT 06897).

Q. When I listen to my two radios side-by-side, they interfere with each other -- my shortwave radios to some degree, but my scanners even worse. Is there a cure? (S.S., Holyoke, CO)

A. All receivers contain oscillators -- miniature transmitters which can be heard on other nearby receivers when tuning by their frequencies. The problem is compounded by

using radios with plastic cabinets which cannot contain their own oscillator radiation, and which pick up the stray radiation from other radios through their cabinets.

Physical isolation helps; grounding may provide additional help. Shielding the radios with foil or wire screen, and using separate antennas rather than common antennas with a splitter is recommended.

In the case of scanners which frequently "lock up" during their scanning sequence when they encounter the oscillator radiation from another nearby scanner, try swapping the frequency combinations between the two scanners; this may be particularly useful if the scanners are of different brands and thus have different IFs (intermediate frequencies).

Another trick is to enter the frequency on one scanner 5 kHz lower, and on the other 5 kHz higher; this results in a 10 kHz frequency separation which may be enough discourage lockup.

Q. When I connect an antenna to my shortwave radio I get interference from high-powered local AM radio stations on shortwave frequencies. Sometimes even distant foreign broadcasters can be heard on frequencies where they shouldn't be. What causes this?

A. "Intermod" -- intermodulation. The signal-handling circuitry of low and medium priced radios simply can't cope with extremely strong signals; phantom products are generated which are heard on other frequencies.

The easiest corrective cure is to add an external passive (not amplified) preselector like the Grove MiniTuner, a tunable filter which allows you to select the frequency you want to listen to and attenuates all other off-frequency signals.

Q. When I try tape recording from the external audio jack on my receiver I get a lot of AM hum. Is there a simple cure? (T.M., Willow Street, PA)

A. While this problem is rarely encountered with newer receivers, it can be easily corrected. Simply install 0.01 microfarad (any voltage) capacitors in series with both the shield and center conductor of the audio cable. This corrective measure should reduce the common mode hum on your recording.

Q. My mobile reception on the 800 MHz band is weaker than on low, high or UHF band. What can I do to improve it? (Doug Smith, Pinkney, MI)

A. The higher the frequency, the more radio signals behave like light rays. Reflections and absorptions wreak havoc on 800 MHz mobile reception and most monitor antennas advertising 800 MHz capability do so more by luck than design.

You may wish to consider changing mobile antennas, using a preamplifier or installing a separate 800 MHz 5/8 wave cellular antenna. This second antenna may be used by itself for 800 MHz reception, or it may be coupled through a standard TV type VHF/UHF splitter configured in reverse to combine the signals from the two antennas into one line for your scanner.

Be sure you install all connectors properly; this is a major problem with mobile radio at these higher frequencies.

Q. How can I tell whether I am hearing images or intermod on my scanner and how can I reduce the interference? (D.R., Johnson City, PA)

A. While both conditions are caused by signals too strong for your scanner to handle satisfactorily, there is a difference. Intermodulation is heard on multiple frequencies exhibiting the same interference, usually in the form of two or more simultaneous signals (voices, music, etc.).

An image frequency will always be offset from its actual emission frequency by exactly twice the intermediate frequency (IF) of the radio; for example, if the receiver's IF is 10.7 MHz, an aircraft transmission on 134.2 will be heard 21.4 MHz higher, 155.6 MHz -- right in the middle of the police band!

Solutions may include using a smaller antenna, installing an in-line attenuator, installing a notch filter, installing a bandpass filter, erecting a directional or frequency-selective antenna, changing radios, changing hobbies, or moving!

Q. I was told that I should turn my mobile scanner off before starting and stopping my car motor. Is there any validity to this? (Jurgen Niemietz, Scarborough, Ont.)

A. No. The concern was that transient voltage spikes and inrush currents from the starter motor could injure the circuitry or that the fluctuations in power could alter or erase memory channels. It doesn't happen.

Caveat on the PRO-2021 frequency expansion

In our May issue we erroneously reported that clipping diodes D45 and D46 in the Radio Shack PRO-2021 scanner would enable 68-88 and 806-912 MHz reception. It turns out that clipping diode D46 will cause the low battery indicator to start flashing!

While the correct diodes to cut are D44 and D45, there is much more to it. The removal of D45 from the circuit will enable reception of 68-88 MHz (for European listeners), after 14 other parts are replaced and a realignment is done, but it will delete 30-50 MHz coverage. The procedure is outlined in the PRO-2021 service manual.

Unfortunately, the elimination of diode D44 only results in the ability to program 800 MHz frequencies into the keyboard; the supportive receiver circuitry is not in the radio. Our recommendation is to let the radio alone!

See p.93 for a special report on the latest PRO-2004 mods

Questions or suggestions sent to MT are printed in this column as space permits. If you prefer an answer by return mail, you must include a self-addressed, stamped envelope.

LETTERS

continued from page 3

More Thoughts on Shortwave Programming

The recent discussions of programming on shortwave in the "Letters" section of this magazine have led me to the conclusion that both the letter writers and the editor who responded to them are in error.

With the exception of the BBC, international shortwave broadcasting *should primarily serve as a supplemental* source of information, much in the same way as the *Christian Science Monitor* serves to provide background to the "breaking" news stories found in other papers. It is not and never will be a primary source of information.

In addition, I think it's clear that shortwave listeners can be divided into two types: the listener and the DXer; the latter having only a hobyy interest in the bands. Fortunately, *Monitoring Times* serves both.

Rod Pearson
St. Augustine, Florida

Fan Mail

I wanted to give my reactions to the March issue of *Monitoring Times*: WOW! Propagation charts. Glenn Hauser! Expanded utility coverage! A big construction project! And all the usual great columns and articles! It's thrills, chills and fun for kids of all ages! Really, *MT* just gets better and better with every issue.

Name withheld by Request
Del Rio, Texas

Program Descriptions, Please

I am enjoying your new "Day-to-Day Shortwave" section but have a request. Could you include short, one-line descriptions of the programs? Some are obvious, like "Financial News" but others, like "Interaction" on Radio Australia are not.

Mary Kenney
Ft. Lauderdale, Florida

Hot on TV DX

Your [May, 1988] article on TV DXing was quite good. I had never really thought about TV DXing until I read the article. Now, however, I'm really hooked on it. And fortunately, just after reading the article, we had a regional "tropo" opening. The TV dial simply lit up. There were stations coming in on just about every channel. And while I didn't get any really distant stations, I was able to see Washington DC on channel 7, Baltimore and a large number of stations from Pennsylvania.

I do have one problem, however. I would like to find some way of IDing some of these stations. Any ideas on books and so forth that can be of assistance?

Ken Powell
Downingtown, Pennsylvania

I would strongly suggest that you get in touch with a club called WTFDA (Worldwide TV FM DX Association). Not only do they publish an excellent monthly bulletin, but offer an absolutely superb little book called, "North American Television Database." Database has stations arranged by channel and by state. If you do any TV DXing at all, you need this book. Write to WTFDA for more information.

Their address is P.O. Box 514, Buffalo, NY 14205-0514. (You might want to enclose a buck to help offset expenses; they are a non-profit group.) It's run by a great bunch of people and comes highly recommended. Tell 'em MT sent 'ya. --Ed.

Who is Ed?

At the end of some of the letters in Monitoring Times, I see comments by someone named "Ed." But his name is not listed on your masthead in the front of the magazine. Who is he? He seems very well informed.

Withheld
Chicago, Illinois

"Ed" is the abbreviation for "editor" and he has withheld your name for obvious reasons. -- *Ed.*

Letters should be addressed to ***Letters to the Editor****, Monitoring Times, P.O. Box 98, Brasstown, NC 28902 and should include sender's address and telephone number. Not all letters can be used. Those that are will often be edited and excerpted. Because of the volume of mail received, personal replies are not always possible.*

(Part I, folks!)

That Versatile PRO-2004

The Realistic PRO-2004, sold through Radio Shack retailers and Grove Enterprises mail order, seems to have caught the fancy of the scanning world. No scanner in recent memory has drawn so much attention -- and modifications -- to it.

A perceptive *MT* reader has discovered that pin 10 on the IF amplifier chip is actually an S meter output. A skilled experimenter should be able to hook a simple balanced-bridge metering circuit to that pin, or even drive a sensitive microammeter directly to show strengths of received signals.

For those PRO-2004 owners who would like to have 400 memory channels instead of the 300 in their stock radios and need parts, Sparks Publishing sells a kit which contains MT reprint instructions, the proper diode, a professional keyboard overlay so that the new memory plan will read correctly on the keypad, and even a 400 channel memory sheet to record those channels for quick reference.

The kit is only $9.95 and is available from Sparks Publishing, 1234 54th, Port Townsend, WA 98368.

Enabling 520-760 MHz?

In a previous issue we mentioned that one reader had called to tell us that he had found two diodes beneath a microprocessor shield, one of which, when disconnected, enabled 520-760 MHz coverage. Subsequent scrutiny of the chassis by us and other experimenters has revealed no such diodes, so we assume that the capability does not exist.

Turbo for the 2004

How about increasing search and scan rates? One enterprising experimenter has discovered that the microprocessor crystal, a 7.37 ceramic resonator, can be replaced by a 10.7 MHz ceramic resonator which really boosts speed.

The present crystal, CX501, is soldered between pins 29 and 30 of the CPU chip (IC503, GRE part number 0327). In lieu of a ceramic resonator, a 10 MHz quartz microprocessor crystal should make a good substitute.

Such crystals are available from high-integrity mail order catalog houses like Mouser Electronics (Mansfield, TX), Digi-Key Corporation (Thief River Falls, MN) and Jameco Electronics (Belmont, CA).

CONVENTION CALENDAR

Date	Location	Club/Contact Person
Jul 9-10	Lake Canton,OK	Lake Canton Field Day/ Tim Mauldin WA5LTM P.O. Box 19097, Oklahoma City, OK 73144 146.52 simplex; 144.85/245.465 rptr
Jul 10	Atlanta, GA	GA State Conv/ Sandy Donahue WA4ABY 960 Ralph McGill Blvd, Atlanta, GA 30306
Jul 10	Pittsburgh, PA	North Hills ARC/ Bob Ferrey, JR. N3DOK 9821 Presidential Dr., Allison Park, PA 15101
Jul 10	Alexander, NY	Genesee RA Inc/ Ed Grabowski KC2ZR 11458 Sanderson Rd, Medina, NY 14103
Jul 10	DownrsGrove,IL	DuPage ARC/ Ron Smith K9QAM 4823 Florence,, Downers Grove, IL 60515
Jul 16	Union, ME	Mid-Coast ARRC & Yanke RC/ Lynda Hawke 198 Cony St, Augusta, ME 04330
Jul 16	Lorain, OH	Northern OH ARS/ John Jones WA8CAE 4612 Timberview Dr, Lorain, OH 44053
Jul 17	Golden, CO	Denver Radio Club/ Dan Duryee KB0J 5115 Federal Blvd 32-B, Denver, CO 80221
Jul 17	Washington, MO	Zero-Beaters ARC/ Ken Bowles K9OCU 14 Geotown Ct, Union, MO 63084
Jul 17	Wheeling, WV	Triple States RAC/ Ralph McDonough K8AN RD 1 Box 240, Adena, OH 43901
Jul 17	Van Wert, OH	Van Wert ARC/ Jack Snyder WD8MLV Rt 2 Box 153-C, Ohio City, OH 45874
Jul 23-24	Chicago, IL	ACLR-DeVry/ Alice Myk 6520 W 28th St, Berwyn, IL 60402
Jul 31	Peotone, IL	Hamfesters RC/ John Schipitsch W9BNR PO Box 42792, Chicago, IL 60642
Jul 31	W.Friendshp,MD	Balt RA TV Soc/ Mayer Zimmerman W3GXK 8711 Allenswood RD, Randallstown, MD 21133
Jul 31	Asheville, NC	W.Carolina ARC/ Phil Haga KA4CAC Rt.5 Box 438, Candler, NC 28715
Jul 31	Grdn Praire,IL	Big Thunder ARC/ Jim Brimsby W9HRF 210 Oak Lawn Lane, Poplar Grove, IL 61065
Aug 5-7	Austin, TX	TX State Convention/ Joe Makeever W5EBJ 8609 Tallwood Dr, ustin, TX 78759
Aug 7	Berryville, VA	Shenandoah Valley ARC/ John Knode N4MM RFD #1 Box 73A, Boyce, VA 22620
Aug 13	Springfield,MO	SW Missouri ARC/ Linda Baxter 2616 West Woodlawn, Springfield, MO 65083
Aug 13	Indpls, IN	Shadow of Pyramid ARC/ David Johnston 9511 /Angola Court, Indianapolis, IN 46268
Aug 13-14	Cedar Rapds,IA	Cedar Valley ARC/ Tom Zuber WN0DRC 4201 Dalewood Ave SE, Cedar Rapids, IA 53403
Aug 20-21	Huntsville, AL	Huntsville ARC/ Jim Brashear WB4EKJ 3002 Boswell Dr, Huntsville, AL 35811
Aug 21	Warren, OH	Warren ARA/ Patty Hillier KE8KH 18334 Rt 62, Beloit, OH 44609
Aug 21	Santa Brbra,CA	Santa Barbara ARC/ Walt Haake K6YJG 3643 Torino Dr., Santa Barbara, CA 93105
Aug 21	Marysville, OH	Union Co ARC/ Gene Kirby W8BJN 13613 US 36, Marysville, OH 43040
Aug 27-28	Madison, GA	Confed Sig Corps Inc/ Roy Jordan WB4ILR 1142 Shoreham Dr, College Park, GA 30349
Aug 28	Mulich Hils,NJ	Gloucester ARC/ John Fisher K2JF PO Box 370, Pitman, NJ 08071
Aug 28	Bluefield, WV	East River ARC/ Charles Gatchell, KE8EI 24 Fairfield Place, Princeton, WV 24740

MONITORING TIMES IS HAPPY TO RUN ANNOUNCEMENTS OF RADIO EVENTS OPEN TO OUR READERS. Send your announcement at least 60 days before the event to: Monitoring Times Convention Calendar, P.O. Box 98, Brasstown, NC 28902.

STOCK EXCHANGE

NOTE: Monitoring Times assumes no responsibility for misrepresented merchandise.

NON-COMMERCIAL SUBSCRIBER RATES: $.10 per word; NON-SUBSCRIBER RATE: $.25 per word. All ads must be paid in advance to Monitoring Times. All merchandise must be personal and radio-related. Ads for Stock Exchange must be received 45 days prior to the publication date.

COMMERCIAL RATES: $30 per 1-3/4" must accompany ad, payable to *Monitoring Times*. Send 1-3/4" square camera-ready copy, or any square copy to be reduced, or send text for typesetting.

Wanted to buy - NRD 525, ICOM R-71, or KENWOOD 5000. Bill [205] 541-2957; Route 2 Box 196, Wetumpka, AL 36092.

WANTED: Crystal Control Mobile Scanner which will cover the aircraft frequency of 108-135 MHz. Call [1-506] 847-3744 or write P.K. White, P.O. Box 446, Rothesay, N.B. Canada E0G 2W0.

Wanted: BEARCAT 350. Need not work. Call PJS at [312] 534-0991, 6 to 10 p.m. CST.

For Sale: KENWOOD R-2000 Communication Receiver like new with manual. Charlie KB2EJW [609] 927-6819. ($375.00)

For Sale: REGENCY TS2 Turbo-Scan. 75 chan. All extras. 6 months warranty remaining. Dated sales slip will be included. Not a good scanner for my area. No box. First $200; REALISTIC PRO2021 programmable 200 chan. All extras. Works great. $100; REALISTIC PRO30 programmable 16 chan hand held. New ni-cads. Excellent condition $50. Lewis Harvey, 3 Egrets' Nest Drive, Savannah, GA 31406 [912] 354-0233 7 am to 10:30 am EDT only.

For Sale: REALISTIC DX-400 portable shortwave receiver; LW, MW, SW, FM; digital PLL tuning; memories; with manual; excellent condition; $100; Westerly RI [401] 596-6332 after 6pm EDT.

For Sale: KENWOOD R5000 with voice synthesizer and manual. New 1-12-88 used very little as I have lost all interest in radio. $640.00. U.S. Postal Money Order and an SASE. Free UPS, USA. Harold Josselyn, 620 Grove Ave, Zanesville, OH 43701.

SONY ICF2001 with multi-voltage AC adpter. Excellent. 75.00 plus shipping; SONY ICF7600 with AC adapter and manual $110.00 plus shipping. Frederick Nagle, RD 3 Box 4 Old Post Road, Bedford, NY 10506 [212] 888-4949

KENWOOD R-2000 receiver with crystal CW filter and GROVE MiniTuner-3. Ex. cond, original carton. All $500.00 cert. check or money order [814] 684-1665.

WASHINGTON, OREGON & BRITISH COLUMBIA SWLs/DXers: UNITE! Join DX/Northwest, a regional club seeking your participation. Meet other shortwave enthusiasts through meetings, DXpeditions, and the monthly Grayline Report newsletter. For information and sample issue, send SASE (or IRC): DX/Northwest, 205 SW Clark #C-4, Issaquah, WA 98027-3772.

For Sale: Shortwave Receivers SONY ICF-4900, $70.00; PANASONIC RF-B50, $75.00; and, PANASONIC RF-3100, $250.00. Excellent condition. Original cartons. All accessories. Rev. Paul B. Schwartz, P.O. Box 7031, Philadelphia, PA 19149-0031, [215] 742-0346.

Radios: YAESU portable, FTH-2005, VHF, 10 channel, scan, programmer, desk charger, spare battery, new $425.00. Pager/monitor, SONAR 2-channel, 154.130-154.175 4-tone charger, $100.00. Home Alert Monitor, ELECTROSONICS EC-22 154.130 4-tone $100.00. John Miller [907] 349-7817 AK time.

Contacts Wanted: Atlanta and New Orleans areas. Experienced monitorists, including broadcast media on assignment during political conventions. John Coker, P.O. Box 1392, Peoria, IL 61654.

YAESU FRG-7700 receiver with 12 channel memory, FRV-7700F VHF converter $425 (mint). SANGEAN ATS 803A portable with AC adapter and stand. $170 (new). Includes shipping. Bob [215] 493-1019.

Wanted to buy, cassette tapes of NYPD or LAPD during periods of heavy activity. Ed Anderson, P.O. Box 4492, London, Ontario, Canada N5W 5J5.

Wanted: Pair of MOTOROLA HT-220's, VHF-HI. Also want police radar speed guns. Mark Hartman, 14 Silver Lane, Kirkwood, MO 63122. Call [314] 966-3894

Wanted: SONY CRF 320A. Excellent condition. Bill Cress, [201] 694-5154, 28 Worcester Dr., Wayne, NJ 07470.

HARD TO FIND PARTS for Shortwave, CB and Crystal Radios for trade, swap or whatever. Write for list of what I have. Jim Yeary, 12922 Harbor #800, Garden Grove, CA 92640.

For Sale: INFO-TECH M600A with parallel printer interface $400. David Cook, 11649 Shasta Lane, Oklahoma City, OK 63162 [405] 755-0795 9:30 to 6:00 weekdays.

SANGEAN ATS-803, brand new, never used, $145. Excellent portable SW. Moneyorder; Ted Miller, P.O. Box 59031, Chicago, ILL 60659.

THIS COULD BE YOUR AD!

INDEX OF ADVERTISERS

Closing Comments

FREQUENCY CENSORSHIP:

Separating Fact from Fiction

This past year three manufacturers -- Tandy (Radio Shack/Realistic), Regency and Uniden (Bearcat) -- deleted cellular telephone frequencies from their scanning receivers. While manufacturers correctly point out that it is unlawful to listen to these ranges, they have not told scanner owners the real reason they have been deleted.

The frequencies omitted (824-849, 869-894 MHz) are only a fraction of those deemed unlistenable by the Electronic Communications Privacy Act (ECPA) of 1986. A partial list includes conventional mobile telephone, paging and broadcast link frequencies in the 26, 35, 45, 152, 157, 158, 161, 450, 454, 459, 894, 929, 944 and 959 MHz bands.

Have these frequencies been dutifully deleted from scanners as well? No. Why not? Tandy, Regency and Uniden produce cellular mobile telephones, thus accounting for their selective consciences. They also belong to the Cellular Telecommunications Industry Association (CTIA) whose money successfully lobbied for the self-serving cellular provisions of the ECPA.

Clearly, it is in the interest of the cellular industry to perpetuate the myth of privacy in their telephone service as an advertising ploy. By making the monitoring of cellular telephones illegal, the deception comes closer to reality.

An attempt by the Washington Legal Foundation to require that all cellular telephones carry a label cautioning users that they could be easily heard was denied by the FCC. No decision has been reached on another petition filed by Regency Electronics to have all scanners carry a warning that some frequencies are unlawful to monitor.

A Fundamental Flaw

Section 2512 of Title 18 of the U.S. Code as amended by the ECPA says that it is illegal to manufacture, sell, advertise or possess any device "the design of (which) renders it primarily useful for the purpose of the surreptitious interception of wire, oral or electronic communications". The terms "primarily" and "surreptitious" are not defined.

Surreptitious, according to the Wiretap Act of 1968, means disguised or designed to be hidden from public view. Since the term now refers to any electronic communications (this would include broadcasts and even transmissions intended for the recipient), novelty sets like Coke bottle radios, built-in computer modems, pocket radio and TV sets, and radios designed for in-home use appear to be illegal.

Another Myth

Have you heard that the FCC is considering outlawing scanners which cover the cellular range? Well, it's not true. While a prominent CTIA figure has been pressuring the Commission to take such action, clear-headed FCC officials recognize the impracticality of omitting all ECPA-protected frequencies and see through the commercial manipulation behind the request to delete cellular capability alone.

Even if such frequency deletion were to come to pass, listeners would continue to monitor deleted ranges just as they do now, by tuning in image frequencies of the prohibited services approximately 21.4 MHz (Radio Shack and Regency) or 21.7 MHz (Bearcat) above or below the signal frequencies.

Frequency converters are also available to restore gaps in coverage and VCRs and TV sets are readily tuned to receive signals unavailable on scanners. The ability to restore cellular coverage on every 800 MHz scanner presently on the market was deliberately designed into these radios; implementation was to await the decision of the marketing moguls who finally decided against it.

And those are the facts.

Bob Grove, Publisher

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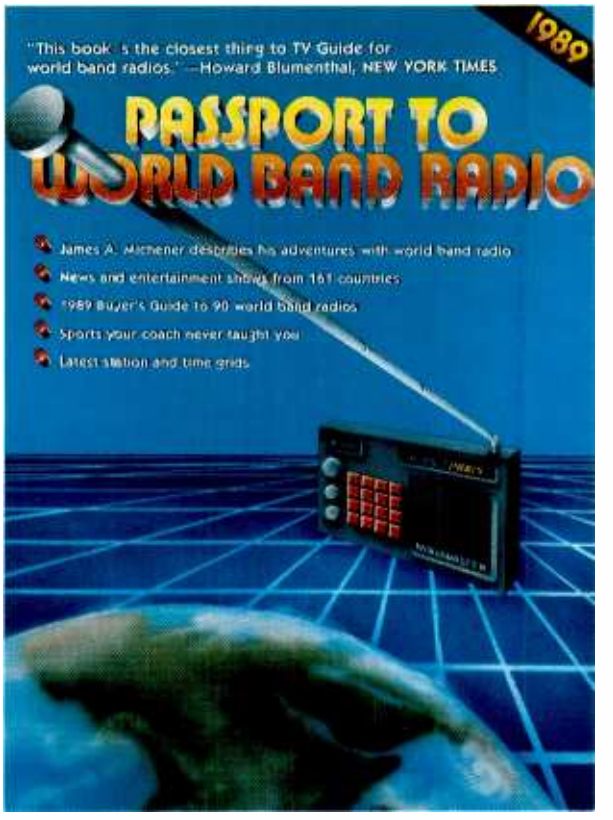

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