

# POPULAR COMMUNICATIONS

MARCH 1998

## Successful Searching: Finding Elusive Scanner Frequencies

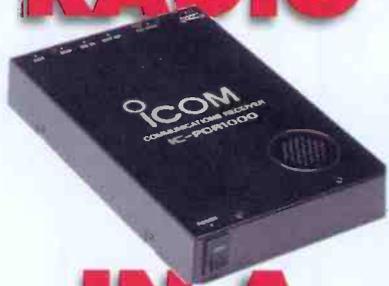
- **Spring into Action—Surfing the AM Broadcast Band!**
- **Cold War Madness: Alice Remembers**
- **CB in the Next Millennium—Are YOU Ready?**
- **Product Spotlight: World-Wide Radio in a Little Black Box—ICOM's New PCR1000**

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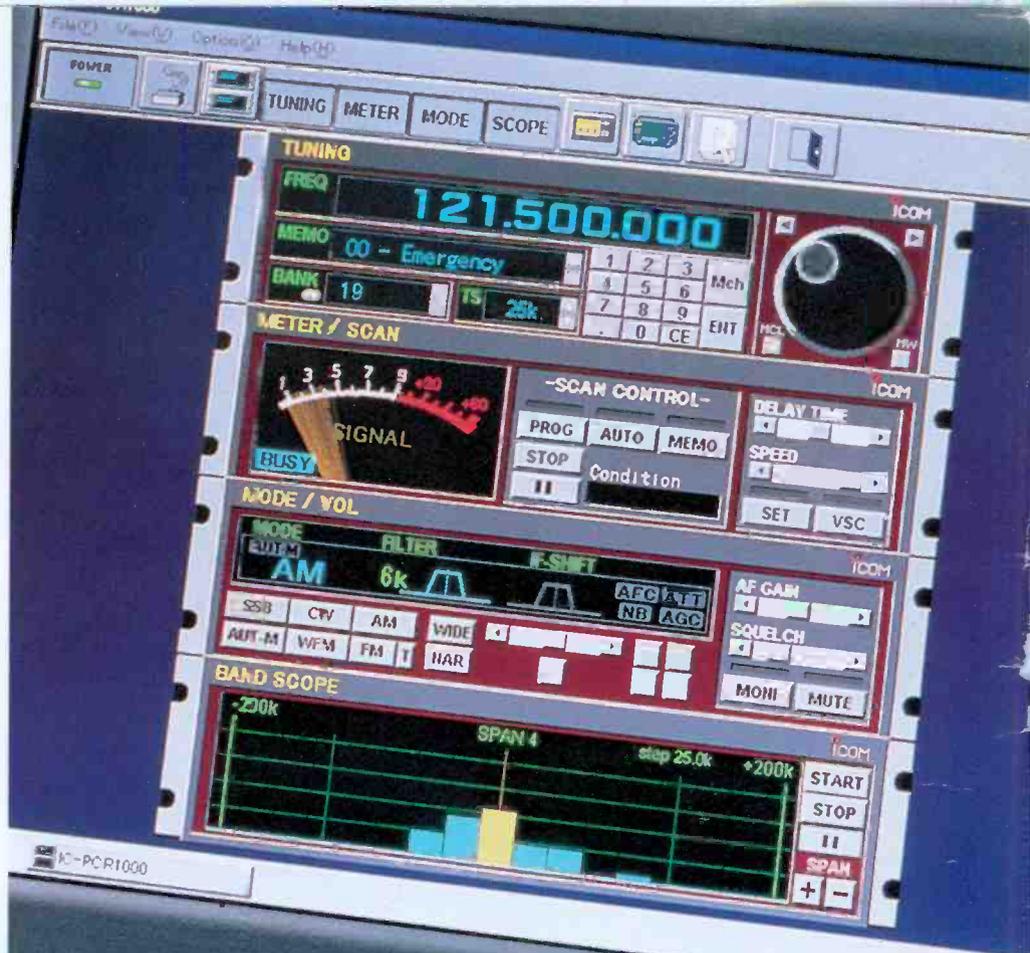


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# POPULAR COMMUNICATIONS

MARCH 1998

VOLUME 16, NUMBER 7

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By Joseph Cooper, VE3FMQ

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By Alice Brannigan

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By Chuck Gysi, N2DUP



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**ON THE COVER:** New York City's WABC-TV news copter flying high over the Big Apple. Hearing traffic reporters on your scanner is easy if you know where to tune. Be sure to check out Chuck's "Scanning the Globe" column on page 34. (Photo by Larry Mulvehill)

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- **Joe Carr's Receiving Antenna Handbook** Arguably the best book devoted to receiving antennas for longwave through shortwave. #3113 \$19.95 (+\$2)
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# Tuning In

AN EDITORIAL

BY HAROLD ORT, N2RLL, SSB-596

## Life Without Radio?

When I was a kid, I remember a massive power failure during this blizzard that thrust nearly all of upstate New York into the dark one cold February morning. Little did I know then that most of us would have been better off had the power company *deliberately* cut power all day Saturday. Anyway, lucky for us that my old man was prepared with flashlights, and Mom got out the candles; whatever we ate for dinner that evening was without my being able to peer from the kitchen into the living room at the seemingly constantly-running tube. After all, TV was - and still is, perhaps more than ever - a staple in our lives. But he did fire up the now classic, pocket-sized transistor radio for the evening news and weather from WGY in Schenectady operating on emergency power.

It always seemed to me that we could do without all the TV racket in favor of the much less annoying and far less intrusive radio. After all, isn't TV the same old, same old? News programs have turned into news magazine programs; news magazine programs have turned into, (forgive us Bryant) a blur of sameness to the point where I frankly can't recall which is which; one day Tom Brokaw is sitting down, the next day he's standing up; Janeway and the crew of the Voyager is inching their way home from the other side of the galaxy (if they'd "put the pedal to the metal" they'd get there a heck-of-a-lot quicker, don't you agree?); CNN has a correspondent in every small town in America; Colombo still drives that old clunker I sold him; — and for most Americans today, TV comes with a monthly pricetag from \$25 to \$45 or more, depending on how much cable TV you can possibly absorb in one evening.

Compare that to a moderate-priced listening post. There's a average-priced receiver, antenna and logbook; total conservative guesstimate might be around \$300 to \$500 or less. Sure, you can spend more - and you probably will as you gain experience in the radio hobby. Now if you want to add a \$2000 computer, big 'ol monitor and printer, you can do that, too. I'm fortunate enough to have one of those in my office/monitoring post, and truthfully, use it not just for working on all the

---

*"So call me old fashioned, but I still believe there's something more magic and exciting about fading, fluttering radio signals..."*

---

articles and columns in *Pop'Comm*, but for receiver control and logging as well. It's got the some pretty high-tech stuff inside. And what's better, I can make a good-looking flyer, access the Internet (if America Online isn't having hiccups, that is), send some e-mail, merge some documents, print a really neat greeting card, and lots of other fun things.

But aside from the receiver control (which I could do without, but it *does* add to the enjoyment), for me, the computer is just a little too impersonal. I like the sound of voices from a speaker and knowing that when I let up on the mic switch, there's someone on the other end. It just feels right. Anyone can send an e-mail or experience the thrill of finding information on the Internet, but it takes some special circumstances to make the *radio* connection. With enough money and a good computer shop down the street, anyone can get the sound card, buy the goodies and follow the icons through the land of cyberspace and voice-communicate on the Internet. If all the electronic wizards are performing correctly, all the telephone connections are good and modems are up to the task, the connection is made and you're in business. So call me old fashioned, but I still believe there's something more magic and exciting about fading, fluttering radio signals; about hopping your antenna rotor and oversize beam stays put in the wind, and the sight of those longwires sagging under the weight of that late winter ice, and hearing stations playing native music from thousands of miles away.

So gather 'round the radio and put on the headphones, because when it gets right down to the nitty-gritty, our hobby is still all about radios, antennas, towers, coax, frequencies, and all the good stuff we've all come to crave in the radio monitoring hobby. The only difference is,

*(Continued on page 32)*

## POPULAR COMMUNICATIONS

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# Pop'Comm P.O.

## LETTERS TO THE EDITOR

Each month we select representative reader letters for our Pop'Comm P.O. column. We reserve the right to condense lengthy letters for space reasons and to edit to conform to style. All letters submitted must be signed and show a return mailing address or valid e-mail address. Upon request, we will withhold a sender's name if the letter is used in Pop'Comm P.O. Address letters to: Harold Ort, N2RLL, SSB-596, Editor, *Popular Communications*, 76 N. Broadway, Hicksville, NY 11801-2909, or send e-mail via the Internet to <popularcom@aol.com>.

### Scanner Info Needed

Dear Editor:

I'd like to hear from anyone with up-to-date scanner info and would like to get together with other hobbyists in my area. Thank you.

Sincerely,

Ken Snipes  
e-mail<ksnipes@visi.net>  
1605 Grimes Road  
Hampton, VA 23363-1147

### Jerry Mastered the Code!

Dear Editor:

Code was a thorn in my way to being a ham for years. Finally got my license when they went no-code. I had an HF rig, so I finally struggled up the classes. Five wpm wasn't real bad with Gordon West's help, but 13 was more luck on my part than anything to pass. Written tests never were a problem, and I took 20 wpm about 15 times before I got lucky again.

I've spent many hours on my computer with Supermorse and finally lucked out, although I still don't use CW on HF. I agree CW is in the way for new hams. The old guard tell me that the ARRL wants to keep the code requirement to keep HF bands from getting too crowded, not to filter out riff-raff. We need more Techs to vote them out of office.

Ham radio can't survive like it is. The new ARRL plan will kill us for sure. We keep butting heads on stupid CW and don't address the real problems facing us. We need new hams, anyone would be bet-

ter than GARBAGE on 75 meters phone. Well enough said, keep up the good work.

Jerry Godshalk, AA9JV  
Indiana

### Harold's One Accurate Statement

Dear Editor:

In response to your recent "Tuning In" editorial, you made one very accurate statement in your editorial. The main being "ham radio is only a hobby." However you contradict yourself immediately by using the comparison of police carrying muzzle loading weapons and stating that the United States Coast Guard has even dropped CW. I can state from experience, being a former Coast Guardsman, who enjoys sailing, muzzle loader shooting and ham radio. Neither the police or Coast Guard communications could be considered a hobby. In order to enjoy most hobbies where your actions could easily infringe on, disrupt, or even threaten the safety of others, it is imperative that you acquire and practice some basic fundamentals.

Gun enthusiasts with the latest state-of-the-art rifles and scopes often consider the muzzle load shooter with open sights the cream of the crop. However, if that same muzzle load shooter fails to practice the basics of gun safety, he is shunned by all.

The hobby of sailing is surely not state of the art or fast compared to other methods of transportation over water. Sailing takes more than just going out and buying a boat, turning the key and taking off. It requires skills and effort. However there are many that would much rather just go out and buy all the latest fancy electronic navigation equipment rather than learn the basics of seamanship that will save their tails when they become demasted and de-antennad in bad weather. The sailing fraternity takes a dim view of those that won't take the time and effort to learn and practice basic seamanship and basic boating safety.

The hobby of amateur radio is not intended to be state of the art, and like other hobbies, it requires effort and perseverance to gain the basic skills. One of those

traditional basic skills is CW. It allows anyone, anywhere, no matter what their economic status or language to communicate via radio. It is the basic form of communication that will make it through when all others fail. Is it any wonder that the majority of the ham community feels strongly compelled to maintain the standards of learning and demonstrating the ability to practice the basics of the hobby?

I think hams, like the skilled enthusiasts of any hobby, have little respect for those that would rather cry about the fact that they just can't buy their way in and haven't the self discipline to take the time and effort required to learn the basics. Thanks for your time.

William E. Smith, WA6YPE

Dear Mr. Smith:

I guess what you're saying here is that newcomers—and Heaven knows the ham community desperately needs newcomers—must go beyond the Technician license to be "real hams." Mr. Otteson points to the "changing world" we all must face sooner or later. And it seems to me that sooner or later—and like most folks correctly assume, it will be later—the Code requirement will either be abolished or changed in such a manner as to become more relevant as ham radio moves into the 21st Century. I'd hate to think of the rest of the world communicating via the Internet without any tests whatsoever while our community is still hung up on an archaic method of separating the men from the boys and girls from women. If we want newcomers to join the fold, we're the ones who have to get in step with the times, not the other way around!

I remember a few years ago the battle cry was about "real hams" building their own equipment, but please know that most "real hams" today (Advanced and Extra Class)—as evidenced by sales statistics—buy \$2,000-plus ready-for-the-air rigs.

You talk about giving effort to learn the basic skills. I understand that in many hobbies from needlepoint to skiing you need basic skills to advance. I wouldn't

(Continued on page 70)

# JRC NRD-345

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- 100 memories that store frequency, mode, AGC time constant, ATT on/off, VFO, IF filter bandwidth, and NB status.
- Noise blanker.
- Clock/Timer.
- High/low antenna inputs.
- Memory scan.
- Personal computer control with optional RS-232C interface cable.
- One-chip DDS-IC in PLL circuit to enhance carrier-to-sideband noise ratio.

# Setting Up A Successful Broadcast Band Monitoring Station

*The Excitement of Surfing the AM BCB Is Back . . .*

By Joseph Cooper, VE3FMQ

Some say that the AM broadcast band is less important today due to the 500-channel TV universe, FM radio and the Internet. This may not be completely true as many people are still "surfing" this "Original Internet" for information. This article shows how this band is ideal for either the beginner or experienced radio monitor. With hundreds of broadcasters still on the air, and many waiting to move into the new expanded broadcast band, there are many interesting "catches" for the local listener and the DXer.

Today many people have given up using their broadcast band radio to listen to distant or unusual stations. If they do use a radio for monitoring "DX," most will most often think of short-wave radio as the place to do such explorations. On certain occasions, such as when you are out driving in your car at night or when dialing across your AM radio's dial in search of a familiar station, you will encounter a distant station you have not hear before. If you choose to listen to that station for more than a moment you may be lucky enough to recapture that special feeling of wonder that comes from listening to a new voice telling you about the local news or events occurring in some distant part of the country.

This article will help show the beginner, and those who are currently monitoring other frequencies, how to "surf" the broadcast band successfully. It will also provide you with the information on how to find Websites on the Internet that provide information on interesting radio stations to listen to on the broadcast band, as well as the techniques and equipment needed to hear the more distant ones.

## How To "Surf" The Broadcast Band

It's not expensive to setup a broadcast band monitoring station because complicated equipment, and a large antenna are not required. A good portable radio with a built-in antenna is all that is needed and these often cost less than \$100. Surprisingly, many of the inexpensive radios often work better in this range of frequencies than more expensive ones.

After you have the radio, you only need a small number of accessories for enjoyment of this hobby. The most important of these are a good "log book" for recording the radio stations listened to, and a data base listing of AM radio stations with their call letters, locations and operating frequency. This latter information is available for a reasonable price from clubs and organizations that support the hobby. You can also get up to date information directly from the FCC and Spectrum Management (Canada) from their Websites on the Internet. It is also suggested that you use a small "lazy Susan" turntable and external loop to improve the sensitivity and selectivity of the radio. How these accessories help to do that will be explained later in the article.



*A good BCB-DX monitoring station. From left to right are: Homemade passive loop antenna, GE Super Radio III, a "Lazy Susan" turntable, monitor speaker with RadioShack DSP (digital signal processor), database of broadcaster callsigns and frequencies, notepad with pen and a VOX actuated tape recorder. You can substitute other radios and equipment, but for best results try and use this configuration.*

When you have begun to "surf the broadcast band" you will find that there are several rewards for your investment. After hearing a new station, most people log their results. Many enjoy logging alone, but many more enjoy writing and sending reception reports to the radio station they heard. If these reports are done properly they are of value to the station engineer and marketing department. With the information you provide the station can determine if they are providing a signal and programming that is of good quality and value to their audience. In appreciation they will often send back a QSL card or letter to verify your own information, as well as souvenirs of the station, such as bumper stickers and other promotional material. Beyond this, the real reward that comes from the pastime is being exposed to many new voices and opinions that are found around the AM broadcast band. In this way the old role of a radio station acting as a "WebPages of the air" is still much with us today. As with the Internet, you can learn a great deal about other cities and towns just by listening to their news, public affairs and on-air personalities.

For those who simply want to recapture the magic of an earlier time in radio when the "surfers" of the AM dial would simply pick out distant sounds from the airwaves and marvel at the miracle of that then new technology we will provide a good starting point - a list of those radio stations that operate on clear frequencies that have little or no interference so that you can begin hearing distant stations with relative ease.

Before you begin listening, you must know the "lay out" of

the broadcast band. Once you know where to find the stations you want, your chances of success are much higher.

## Basics To Know When Setting Out

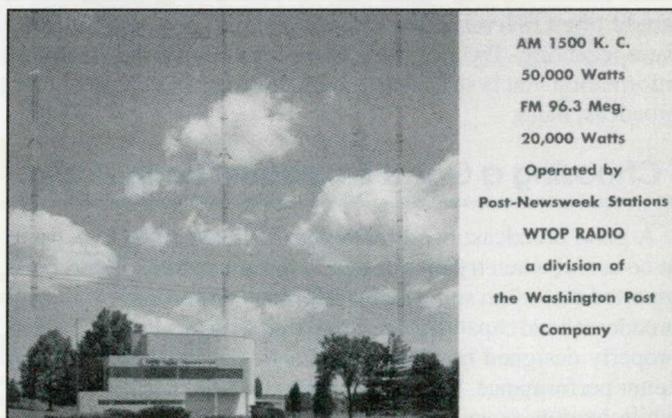
The broadcast band is found between 530 to 1610 kHz, with a new expanded band being located between 1620 to 1710 kHz. When listening in the United States and Canada you will find that the stations are spaced in 10 kHz steps, called channels, with all station frequencies ending in zeros (such as 650, 1010, 1600, etc.). In Europe, Africa and Asia the spacing is smaller, with it being done in 9 kHz steps, while in South America and Caribbean there are some stations that are using 4 and 5 kHz spacing.

In North America the frequency channels for the broadcast band are grouped into different classifications; clear channels, regional channels and local channels. Each channel classification has its own level of power that can be used by a particular station, as well as the direction in which its antenna system can radiate. In general, power in North America is restricted to 50,000 watts maximum, with most stations being restricted even further during the nighttime to prevent interference to other radio stations due to changes in propagation.

Broadcast band radio stations use vertical antenna systems to deliver their signals to the listener. This is due to the fact that broadcasters take advantage of the fact that radio waves in this frequency range travel along the ground (called ground waves) during the day, and are not reflected off of the ionosphere as shortwaves are at that time. This helps to prevent interference from other radio stations, and it is one of the reasons why this frequency range was chosen for broadcasting. At night, though, the situation changes as these same signals are refracted from the ionosphere sending radio signals long distances. In fact if conditions are favorable, and if your receiving system is set up properly, it is possible to receive broadcast signals from South America, Europe, Asia, and other parts of the world.

While long distance reception of broadcast band stations is a good goal to aim for, picking up local and regional stations can be very rewarding for the beginner. Many broadcasters that are nearby will welcome cards and letters as these can be used by their marketing departments to show how well they are covering their broadcast area. The success that you have in getting a reply from these stations will depend upon the quality of your reports, and the information that you provide in them. Most broadcast band DX listeners quickly learn that it is not enough to simply supply a time and a date when a station is heard. Later in the article we will supply you with a minimum list of information that a report should contain in order to help you receive replies more frequently.

When you begin to listen for distant stations on the broadcast band, you will have your best success when tuning in a special class of stations whose frequency, location, and power levels will make your task much easier. These are the "clear channel" stations, and as the name implies, they are located on certain frequencies that are "clear" of interference. At one time these clear channel stations would have an entire frequency all to themselves, and they could be heard almost anywhere in North America if conditions were good. Today there are still a few stations in this clear channel category, and many have historic call signs that date back to the early days of radio. Today most clear channel stations now share a frequency with some other stations due to the large number of broadcasters on the air, but many now use directional antennas to reduce the chance of interference with each other. A list of clear channel stations is pro-



*The author received this attractive QSL from WTOP, 1500 kHz in Washington, DC.*

vided so you can get started right away on some good DXing. Try logging these stations first for practice, do your report and then try to receive verifications from each one. By starting this way you will quickly improve your skill and techniques to the point where you will begin to hear the signals of low-powered and distant stations when conditions permit.

## Parts of Your Monitoring Post

As we noted before, you do not have to have an expensive station in order to be successful in your monitoring of broadcast band stations. To be successful, though, you will need to set up four main items in order to begin your monitoring properly:

- \* A broadcast band radio with a built in ferrite loop antenna.
- \* A "lazy Susan" turntable to rotate your radio either in the direction of a station or away from one that is causing interference to the station you want to hear.
- \* A good system form logging your reception results.
- \* A listing or database of broadcast band stations with call signs and mailing addresses for verification reports.

The addition of some accessories will improve the reception of stations by improving their signal strength and reducing the noise or interference. The suggested items to be used are:

- \* A map or atlas to help you find where the location of stations.
- \* A passive loop antenna.
- \* A digital signal processor (or DSP) to help filter out noise and interference while improving the quality of sound at the speaker.
- \* An external speaker for the radio or a good set of headphones.
- \* A tape recorder to keep a record of your monitoring session.

These accessories are all reasonably priced, and some, such as the loop, you can even build yourself. In any event, what is most important for your monitoring success is to take your time and enjoy listening to the new stations that you pick up in your "surfing." Remember how the people of the earlier time in radio

would often marvel at the information and personalities they were receiving. Try and re-discover for yourself the wealth of information that is still available on this original Internet of the broadcast band.

## Choosing a Good Broadcast Band Radio

A good broadcast band radio does not have to be expensive to be useful when trying to listen to distant stations. It has been reported that when some high performance shortwave rigs with broadcast band capability are compared with less expensive, but properly designed broadcast band sets, the latter have shown better performance. This is due to the fact that a shortwave set, while having exceptional sensitivity and gain, may become overloaded when receiving broadcast band signals due to their proximity to the receiver. As a result, most modern shortwave sets are "de-tuned" so that their broadcast band sensitivity is deliberately reduced. So even though the signal may enter into the receiver through the same antenna, it may be routed into an attenuation circuit first in order to prevent the signal from overloading the front end of the set.

When designing a good broadcast band radio, it is recognized that there are many strong signals found in the broadcast band, so sensitivity is not always important. What is needed in order for a design to work well is to improve the *selectivity* of the set in order to be able to "dig" one signal out of the many that may be heard. In addition to this, a good ferrite loop antenna as has already been discussed is needed as well, as one other type of selectivity that comes from being able to aim at a desired signal. A final important quality is good audio reproduction so that the sound at the speaker or headphone is quite clear (particularly when trying to hear a weak signal).

One of the most popular radios used by broadcast band listeners has been the General Electric "Super Radio" series, which was first introduced in 1979. The radio was designed from the beginning to be a performance set capable of receiving distant stations, while at the same time being very affordable, with a list price of \$79.95 (though the actual selling price can be much less). The primary features of this radio are tuned RF stages, 4 stages of IF tuned circuits, a 6-inch speaker with tone control,

and most importantly - a 200-mm ferrite loop antenna. At this time there have been three versions of the set sold, with version III having been introduced in 1993, which supports the expanded AM band and a "wide/narrow" bandwidth control. Based on these features this radio will be used to illustrate how a typical station can be put together, but other compatible sets can be used with equally good results.

## Setting Up Your Monitoring Station

Your monitoring station does not need to be fancy or take up a lot of room in order to be useful. Once you have collected all of the main components you will only need to use a simple table, such as card table, as a place to setup your equipment. The key to the enjoyment of your monitoring is to ensure that you have enough room to set up your equipment and still be able to do other tasks, such as writing your log reports. Good lighting and a proper seat are also very important for your monitoring comfort, particularly if you intend to spend a few hours in front of your set.

When setting up your equipment place the radio on the "lazy Susan." The reason you are doing this is to point the set toward the strongest signal of the station you wish to receive, or away from one that may be causing interference. You should be able to turn your set a full 360 degrees, though most of the time you will only need to change direction by a smaller amount. Remember that you should still have good access to your controls while being able to rotate the set, so keep your monitoring area clear. Since you are turning the radio away from you, you will also be making it more difficult to hear a station, as you will sometimes have the speaker facing away from you. You should use headphones or an accessory external speaker that will always be facing you.

Two other optional accessories that you should consider are the passive external loop and the DSP, or digital signal processor. Each of these helps you to be able to increase the strength of the signal and to remove noise and interference from the received signal. The loop is placed at the side of the radio receiver and is tuned to a point where either the signal becomes louder or interference becomes less. This is due to that loop having become "coupled" with the radio's own built in ferrite loop and increases its efficiency. The DSP is attached between the radio and the external speaker (though some contain a built-in speaker themselves). This device "samples" the audio of the radio and converts it into a digital form that is acted upon by a special circuit which removes noise and limits interference on those frequencies that are on either side of the desired signal. With such a device it is much easier to hear a weak station that may be close to a stronger one, or one that is on a frequency with noise.

Remember that when you are not using your equipment it is best if all of the components are either stored in one spot or put away in a convenient place. When storing the radio it's important to give your radio some extra protection by removing the batteries (if they are being used) and wrapping the set in a towel to keep it from being scratched. The batteries themselves should be kept in an enclosed plastic box to contain any "leaking" of their corrosive contents if it occurs. By storing your equipment in this way you should be able to set up your station quickly at home, or be able to move it to another location in order to hear new stations. What ever your choice of setup, remember that the real key to being successful in your broadcast band monitoring is to keep everything easy to find, easy to set up, and easy to use. Nothing



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**LISTENER VERIFICATION NOTICE**  
It's a pleasure for us to confirm your reception of WHAS on

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WHAS is a clear channel 50,000 watt radio broadcast facility on 840 KHZ on your dial. We hope you'll tune to Radio 84 often in the future.

**WHAS RADIO 84**  
LOUISVILLE, KENTUCKY

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AM-750 WSB RADIO - 50,000 WATT CLEAR CHANNEL  
VOICE OF THE SOUTH

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Khz FROM 0330 UTC ON MARCH 20, 1996.

THANK YOU,

GREG MOCERI  
OPERATIONS DIRECTOR

GCM/cb

*WSB, 750 kHz in Atlanta, GA verified Joe's reception of March 20, 1996 with this letter.*

stops you from enjoying the hobby faster than not being able to use your radio equipment properly.

## Monitoring the Broadcast Band

Radio monitoring can be done at any time during the day, but due to the propagation characteristics of the broadcast band you will hear more distant stations at certain times than others. Unlike many shortwave frequencies that are best heard during the day, the broadcast band is exclusively a nighttime band for receiving stations at long distances. As a result of this phenomenon, many broadcast band radio stations have to change the pattern in which they transmit their signals, or else reduce their power, at sunset each day. This is done in order to prevent a station in one part of the country from creating too much interference to another on the same frequency. Due to this fact there are special challenges to picking up certain BCB stations depending upon your location and the time you chose to do your monitoring.

When you begin your monitoring of the broadcast band you should first determine your local and regional stations. These will generally be the strongest signals; the frequencies they are on will always be the most challenging to hear new stations. Don't ignore them though, and even if they are local, they may appreciate a note from you that you are listening to them. Once you have worked out their location on the dial it's time to hunt for those stations that are on the edge of your normal listening range. You will also begin to encounter your first distant stations on the clear channel frequencies. The key to enjoying this part of your monitoring is to keep a log of each station you encounter as you tune across the dial (we will explain how best to do that later on).

To get your best listening results when monitoring the broadcast band, you should start your listening near sunset or sunrise

- that's when you'll hear some important changes in the way that the ionosphere treats radio signals. At that time the ionosphere will begin to permit the "skip" phenomena, which is when long distance signals are heard. During the nighttime you will find that your listening conditions will most often change from hour to hour, day to day, and season to season, so you will continue to find different situations that both challenge and support your ability to hear stations.

## Logging a Station and Getting It Verified

The logging of a broadcast band station is more than simply noting the callsign, time/date heard and frequency, though each of these things must always be noted. To get a verification of reception from most broadcasters you will have to demonstrate through your report that you have actually listened to their broadcast. This means that you should spend some time with your newly found station. How long that is should be up to you, but the key is to let it be long enough to make good notes.

When writing your log notes you do not have to transcribe the entire listening session (though some people do record them as they are listening). Most successful monitors provide the broadcasters with what they want to know; not the strength of their signal in your location (the assumption is that it will always be weak once it goes outside of their normal broadcast area). What you *should* include in each report is a record of what parts of the broadcast you heard that made up the stations "personality." This would generally be the stations' on-air identifying slogan or logo (for example, "All hits radio," "Your Oldies station," "All talk radio," to name only a few examples; the "format" of the station, such as whether it emphasizes music, news, talk, or a mix; the times when you heard different things, such as a song, the news, or a special report; the name of the on-air personality you heard; advertisements with a note about the product sold, the location where it was being sold, any personalities involved, and any other information that a marketing department would be interested in hearing; and a summary of any news reports, giving the key point made, the people involved, and any references to any local towns or streets mentioned.

This may seem like a lot, but when you provide such information you truly are listening intently to the broadcast, rather than simply monitoring. By being a good audience you are helping the broadcaster judge the effectiveness of their programming, and particularly their ability to get their message across. This is much more important to them than information about their signal alone. This does not mean that you should not mention interference, distortion, or other problems that made their transmission difficult to understand, but just remember to include it as supplemental information rather than being the most important.

Once you have made your log entry, then you should write a report for the station that will be good enough to get verification back. There are several ways in which this can be done, ranging from a simple letter to a detailed form. The key here is to experiment, ultimately finding which type of report, and the amount of detail they contain, that brings you a response from the radio station. For some people who monitor the broadcast band the development of different strategies for successful replies is almost as important as hearing the station in the first place.

Keep track of your collection of replies, and if you're lucky you may also start to receive other rewards as well. Some stations value well done reports, and may include promotional bumper stickers, kitchen magnets, or program guides. These are

considered to be valuable by many people who monitor the broadcast band, so make certain that you treat them as an important part of your collection. Some people also collect station identifiers off the air by taping them. Next to verification replies, many feel these are valuable as well, particularly for ones that are older or are from stations that have "gone dark" (that is they have either gone off the air, or have changed call signs).

You may also want to have a map of your location or even the continent, and use either pins or marks to keep track of your successes. Some do this by drawing lines from your location to the spot where the station transmitted the signal you heard. This helps you to see the pattern of your stations' monitoring capability, and can help you find any "blind spots" in your coverage. Certainly the pleasure of marking locations that are increasingly distant can help you keep motivated to make "one more catch."

## Getting Involved With Others

After you have been logging your broadcast band listening sessions for a while, you may want to explore ways to improve your skills. The simplest way to do this is to read about broadcast band monitoring in the pages of *Pop'Comm*. Each month new information is provided on both current and past broadcast stations that can help you to better understand who is on the band through the columns provided. You are also welcome to share your logging and reception reports with *Pop'Comm*, all of which contributes to making *your magazine* more enjoyable to read!

You may also wish to join one of the many clubs that specialize in listening to the broadcast band. Most clubs offer assistance in the form of books, magazines or newsletters. You may find that by reading about the ways other people use their equipment, or finding out about their successes, makes your own monitoring more enjoyable and rewarding. Over time you too may be able to contribute with letters, reports or articles to these groups and periodicals as you increase your skills and knowledge.

One club that's been around since 1933 is the National Radio Club, at P.O. Box 5711, Topeka, KS 66605. Also check out the Ontario DX Association at Box 161 Station 'A' Willowdale, Ontario Canada, M2N 5S8.

One area of information that is becoming increasingly important is the Internet, and several Web pages now exist for broadcast band hobbyists. These sites are set up and maintained by individuals and clubs, while the radio stations also maintain some pages themselves (though these tend to be promotions of the station for local listeners rather than being set up for the benefit of long distance monitors). Through these pages you can now get access to database information on the location of radio stations and mailing addresses simply by providing a call-sign. You can also find information about building directional antennas, improving reception and catching rare stations. Next month we'll pass along some interesting Web sites for broadcast band enthusiasts.

One enjoyable activity that many groups become involved in is the "DXpedition," where a group of people will go off to a location outside of a city or town where noise is at a minimum. In these locations it is often possible to set up large antenna arrays that are often hundreds of feet long in order to pick up distant stations. In these settings it is not unusual to be able to hear stations from Europe, South America or Asia, depending upon receiving conditions. Even if these rare catches do not take place, it is quite possible to hear stations from all over North America and Mexico with ease. By doing such activity in a group setting you are able to learn from the experiences of others and

## Clear Channel Stations

Frequency (kHz)	Station
640	WGST Atlanta GA
700	WLW Cincinnati OH
720	WGN Chicago IL
740	KCBS San Francisco, CA
810	WGY Schenectady, NY
870	WWL New Orleans, LA
1020	KDKA Pittsburgh, PA
1060	KYW Philadelphia, PA
1100	KFAX San Francisco, CA
1120	KPNW Eugene, OR
1140	KHTK Sacramento, CA
1160	KSL Salt Lake City, UT
1180	WHAM Rochester, NY
1210	WGMP, Philadelphia PA

Note: The clear channels on the broadcast band once contained only single high-powered stations that could be heard across the continent. Today the regulations have changed to allow more stations per frequency, but you will still have a better chance of hearing your first DX stations when tuned to these "clear" channels.

share your own as well. No matter how well or poorly the reception is during such outings, the reward of getting together and sharing your experiences is the real reward of it all.

## Some Final Suggestions

Today many broadcasters are lining up for the new spaces being offered in the expanded frequency area, while others are finding that their listening audiences are actually growing. Radio for most will always be a more personal and friendly place to be than other forms of communication. This is simply because there is really nothing more personal than the sound of a human voice, for it is through this, the original medium of human communication, that you get the full range of emotions and personality.

If you take your time and really listen to the many broadcast stations that dot the country you will quickly find that what the country really is made up of is the sum of its people and their communities. Each station in each location makes its own unique contribution to the civic life of the country by putting the personality of the people on the airwaves in ways that other mediums cannot.

Consider these thoughts if you choose to go into the interesting and challenging practice of broadcast band monitoring, and remember that the goal is not always capturing a large number of loggings, or even receiving an equal number of reception verifications. What should be kept in mind as you move across the radio dial is what motivated the original listeners from the 1920s; a quest for information. If simply hearing a station was all that was involved with radio then, it would never have persisted to the turn of the century. In the same way we would not have the Internet today if it were not for the fact that it provides people with information that they would not normally have.

If simply making contact over distance was all that was part of the 'Net, then it too would not have become what it is today. So when you monitor and hear a new station, take your time to treat it as if it were a Web page, and collect the knowledge that it contains rather than just making it one more logging on a piece of paper. In this way you will really benefit from your listening time, and come to grow in your knowledge of what makes your country as special as it is by listening to the many and varied voices of its people. ■

# Small Voices For Freedom Were Heard

***At The Height of The Cold War, a Network of Underground Broadcasters Drove the Soviets Crazy!***

By Alice Brannigan

The Nazi occupation of Czechoslovakia during World War II ended in when Soviet forces, aided by Czechoslovak groups, crossed into eastern Czechoslovakia and, in May of 1944, reached Prague. Elections were held in 1946, and because the Communists had garnered 38 percent of the votes, Clement Gottwalt (a Communist) became the prime minister.

Two years later, new elections were scheduled, but the Communists seized complete power before they could even be held. Gottwalt became president, instituting a very harsh Stalinist Soviet-satellite regime with strict suppression of all opposition.

As 1968 dawned, Czechoslovakia was swept with grass roots demands for democratic reforms and political freedoms. The Stalinist, Antonin Novotny, was kicked out as party leader and replaced by a Slovak, Alexander Dubcek, who promised reforms. In March, the nation's leaders were all replaced by reformers. By July, however, the Soviets

and other Warsaw Pact nations were decrying the Czechoslovak liberalization, and demanding that it end. This was backed up, on August 20, by Soviet forces invading Czechoslovakia to return it to conformity with Soviet-bloc norms. The Soviets were accompanied by forces from Bulgaria, Poland, East Germany, and Hungary. The invasion caused students and workers to immediately begin rioting, but the invading forces still commenced to oust liberal leaders from their posts and impose censorship on the media. Dubcek and a delegation of ousted leaders were called to Moscow for a stern lecture and pep talk.

In 1963, the Soviets had ended jamming of Russian language broadcasts of the VOA and the BBC. The jamming began again on August 21 so that the Russian people couldn't hear Western accounts of the Soviet invasion of Czechoslovakia.

Soon after midnight (UTC) on August 21, Radio Prague had proclaimed to a shocked world that Soviet and other

Warsaw Pact forces had crossed Czech borders and were occupying that nation. The announcer stated the station would play the Czechoslovak National Anthem; it would be "the end." Then the station went off the air.

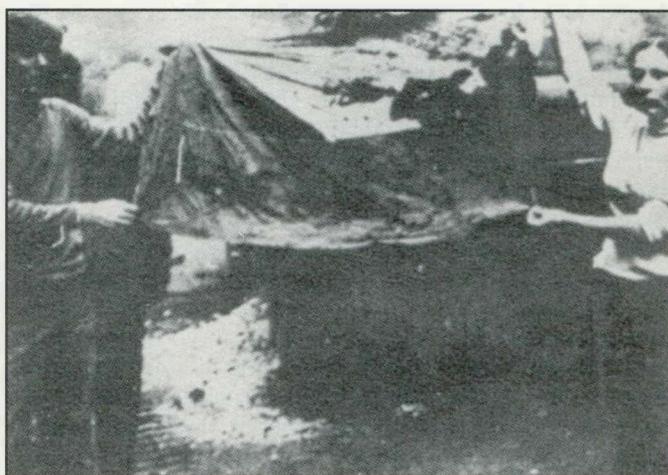
CTK, the Czechoslovak news agency, was able to continue operating for most of the remainder of that day until its facilities were taken over by the Soviets. Just before CTK was shut down, its staff was able to send a final RTTY bulletin that the agency was about to be closed, and the notice that if additional press messages were received bearing a CTK dateline, those dispatches would not be from their staff members.

## **Free Czech Radio Begins**

Almost as soon as Radio Prague had gone dark, stations describing themselves as "free and legal" Czechoslovakian broadcasters began appearing to report accounts of the invasion. In open defiance of the Russians, the broadcasts



*Defiant Czechs carry their flags past a burning Soviet tank in Prague. Outraged citizens blocked the Russian approach for hours on August 21.*



*In Prague, students proudly display a blood-drenched Czech flag in front of a burning Soviet tank.*

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The Micro Decoder has a built-in audio input allowing for easy connection to any receiver's speaker output. The all new Micro DTMF Decoder from Optoelectronics; The Best in Test.

Patent No. 5,471,408

#### FEATURES

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- Internal microphone for radio speaker or tape recorder
- Line audio input jack for direct connection
- 2000 character Non-Volatile memory
- 200 hour operation from single AA alkaline battery
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- Left and Right Scroll in recall data mode
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- 10MHz - 1.2GHz range
- Auto hold
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- 3 selectable gate times for increased resolution



Patent No. 5,471,408

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Free Czech Radio clandestine stations began popping up all over the nation as soon as the invasion began.



Czech youths wearing national colors demonstrating against the occupation. The banner reads "USSR Never Again!"

originated from Prague and other locations across the nation.

Notably, Prague was on 638 and 1286 kHz, plus 66.83 MHz FM. A transmitter in Brno was on 953 kHz, while Ostrava operated on 1520 kHz, with Kosice on 1232 kHz. A transmitter on 272 kHz was heard from Uherske Hradiste. Other broadcasting stations were noted on 613, 701, 5483, 7490 kHz, as well as other AM, FM and SW frequencies, plus TV!

While occupying forces had taken control of some studio and transmitter facilities and damaged or destroyed others, Czech and Slovak Freedom Radio networks continued to function. They had also established networks for exchanging two-way communications.

## Frustrated

Frustrated, the Russians attempted to jam the broadcasts by superimposing other programming on the Czech frequencies. This had little effect as the stations continued to operate and tell the outside world what was happening.

The network had sprung up from numerous locations within the nation. Each regional station would transmit for no longer than 15 minutes on prearranged skeds allocated to local studios reporting on events in their areas. At first, there were delays of more than five minutes between transmissions from different locations, but as the network became more efficient, the operations became more seamless.

This was all quite remarkable in that the transmitters were operated from makeshift locations and facilities, included a mixture of amateur and homebuilt equipment, and were operated while constantly on the run from Russian security forces. Yet the Freedom Radio network was instrumental in the overall resistance

to the Soviet invasion, and as its operators continued their broadcasts, their evasion techniques took on many imaginative and innovative techniques.

## Tricks and Techniques

At the request of network operators, local residents changed street signs and erected bogus detours at critical road junctions across the country. Polish troops who had crossed the border into the Tesin area traveled some 60 km before realizing they had been routed back to the very same border point where they had first entered.

Street names in major cities were either shuffled around or else obliterated in order to confuse invaders. Names of towns and villages were also changed or swapped to further boggle the minds and maps of the outsiders.

Locals who cooperated with the invaders were warned of dire consequences. Within days after the invasion, the network began broadcasting the license plate numbers of unmarked cars used by the secret police. Soon after, the network also regularly began broadcasting the names and addresses of Czech and Slovak citizens who were collaborating with the Russians. Unfortunately for some of those so identified, not all of this information was accurate.

## Not At All Happy

The Soviets were not sitting idly by while resistance radio grew in importance and effectiveness. Direction-finding equipment was used to track down some stations, and Moscow sent additional direction finders and jammers to step-up efforts against the network. A trainload of equipment was dispatched.

Free Czech Radio called upon railroad

workers to slow down or derail the train carrying the electronic equipment. Signal lights were duly sabotaged, and the train was stalled for nearly a week about 180 miles from Prague, its destination. Angry Russian troops grabbed transistor radios out of the hands of citizens in the streets in an effort to hinder cooperation. This had little effect since they took relatively few sets and didn't stop people from listening to radios in their homes.

## The Operators

The Freedom Radio stations were run by technicians, reporters, and commentators who had worked for Radio Prague and other stations. When the Russians shut down their stations, they set up their clandestine, semi-portable, network. On more than one occasion, a freedom station would abruptly go after announcing that Russian soldiers were at the door. Within minutes, another freedom station would be heard to come up on frequency to replace the seized one.

There were reports that the Czechoslovak army (which remained loyal to Dubcek) contributed significantly to the Freedom Radio effort. This included providing transmitters and other equipment, as well as trained personnel, to help operate some of the stations. On the other hand, many stations in the network were no more formidable than people's personal ham stations. It was evident that the entire nation supported Freedom Radio, even early in the occupation, and the Soviets had no idea of the resistance they would meet.

## Other Voices

It should be noted that the propaganda war was not at all one-sided, nor was Free Czech Radio alone. While Free Czech

Radio operated, pro-Czech broadcasts were heard from Radio Novisad, 1268 kHz, in Yugoslavia. Pro-Soviet broadcasts during the invasion were coming from clandestine stations believed to be in Poland, East Germany, and Hungary. On August 25, the USSR resumed broadcasts to Czechoslovakia after an 18-year lapse in such programming. Some 20 hours of programs per day were beamed in over long, medium, and shortwaves.

## Things Simmer Down

By early September, an admonished Dubcek and his delegation had returned to Prague and the invading forces were beginning to pull out. Some previously existing broadcasting stations began to return. However, in the face of increasing government restrictions, many stations, in defiance of government edict, carried only music or poetry. Some refused to operate at all. One station that had suspended operations claimed it wasn't able to return to the air because military forces had damaged its studios.

As of September 9, normal broadcasting was generally in place as the result of persistent efforts on the part of the Czech authorities. The role of the Freedom Radio stations had ended. Two networks, Radio Prague, and also Radio Czechoslovakia, were noted and then the international service of Radio Prague was resumed on regular frequencies. CTK resumed press operations, apologizing to subscribers for the interruption in services, "due to circumstances beyond our control."

It was apparent that the Soviets could not cope with the Freedom Radio stations. Until that time, never had a nation so large been unable to suppress the clandestine broadcasters of an occupied smaller nation. Free Czech Radio must have really been a thorn in Moscow's side.

In April of 1969, Dubcek resigned as leader of the Communist party, and those who replaced him imposed stricter censorship and stifled political dissent all the worse. In 1973, amnesty was offered to some of the 40,000 who had fled during the 1968 invasion, however the nation remained locked in a repressive state. A human rights manifesto signed by more than 700 Czechoslovakian intellectuals and former party leaders served only to tighten the repression of the public.

In November of 1989, with the encouragement of the new leader of the Soviet Union, Mikhail Gorbachev, cries for

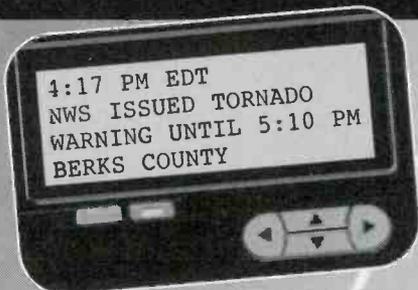
democratization swept through eastern Europe. Protesters in Prague took to the streets to demand free elections. Police attempted to crush the ongoing riots, but the Communist leaders resigned and within several days, 24-million workers went on strike.

In December, the first cabinet in 41 years was elected that didn't contain a Communist. The following year, Czech and Slovak leaders agreed to a peaceful split of the nation into two independent states, Slovakia, and the Czech Republic. Both nations are, today, free democracies.

They can proudly look back on the 20 incredible days in 1968 when their feisty Free Czech radio network tweaked the nose of the Russian Bear.

We'd really like to hear from you! Please pass along any old time radio and wireless picture postcards, photos, QSLs (good photocopies are OK), station listings, newspaper clippings, etc. You are also invited to share your memories, anecdotes, and story suggestions. Our e-mail address is <Radioville@juno.com>. Until next month, we'll see you on the road to Radioville! ■

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# The Radio Connection

BY PETER J. BERTINI  
e-mail: RadioConnection@juno.com

A LOOK BEHIND THE DIALS

## Philco Radios, Capacitor Voltages and Decoding Resistors

Last time we had chatted about removing the old components from Philco bakelite block condensers. It's time to start rebuilding those old bakelite blocks using new capacitors and resistors.

### Another Guinea Pig!

I also have a Philco 66 on hand awaiting restoration. I will show an alternative method of restoring Philcos using the 66 tombstone chassis. This set will have the old blocks removed and replaced with components mounted on terminal strips. For the 89 cathedral, we will be showing a more ambitious restoration that includes fixing up a badly rusted chassis, as well as rebuilding the blocks.

Whether you rebuild or replace the blocks is a personal decision. Serious Philco buffs prefer to have the blocks in their sets rebuilt.

### Finding the Model Year

Philco was noted for making many variations of radios using the same model number — for example a 37-630 could be a tombstone or a console model. The model 66 and model 89 also came in several different cabinet and chassis styles. It's important to note the "code" number, if present, when looking up a particular model in the Rider index. The model 89 set underwent considerable revisions — information on this model spans Rider volumes III to VII. Some revisions reflected relatively minor circuitry changes, others reflected more extensive redesign efforts.

The early versions of the 89 used six tubes: a 36 served as the converter tube and two 78 tubes followed in a two stage IF. By "Run 14", a more modern 77 tube replaced the 36. This change improved oscillator performance. The final version, Code 126, bears little resemblance to the original receiver.

Although still a six-tube chassis, somewhere before code 123 the set started

Table 1 - Capacitor Values Used In The Philco Bakelite Block Capacitors

Philco Cap Values	Modern	NTE	Panasonic	Comments
.00011 mfd (110 pF)				See text
.00025 mfd (250 pF)				
.0007 mfd (700 pF)				Use two .0015 caps in series
.001 mfd	.001	102	.001	
.0014 mfd	.0015	152	.0015	
.002 mfd	.0022	222	.0022	
.003 mfd	.003	302	NA	
.003 mfd	.0033	332	.0033	
.005 mfd	.0047	472	.0047	
.005 mfd	.005	502	NA	
.006 mfd	.0068	682	.0068	
.007 mfd	.0068	682	.0068	
.008 mfd	.0082	822	.0082	
.01 mfd	.01	103	.01	
.015 mfd	.015	153	.015	
.025 mfd	.027	273	.027	
.03 mfd	.033	333	.033	
.04 mfd	.039	393	.039	
.05 mfd	.05	553	NA	
.05 mfd	.047	473	.047	
.09 mfd	0.10	104	0.10	
0.10 mfd	0.10	1004	0.10	
0.15 mfd	0.15	154	0.15	

Note: Use 1000 volt disc ceramics to replace pF value caps.

sporting two high- $\mu$  type 44 tubes. One serves in an added tuned RF stage, the other replaces the two 78 tubes used in the IF stages. A shortwave band was added around Code 123.

I had a hard time nailing down the exact revision of my set. The gold label on the chassis which gives this data was damaged. It did say model 89, and Code 12x; the part of label with the last digit was missing. The tube chart inside the cabinet provided some clues. This set used the early 36, but had the 39/44 tubes in the RF and IF stage! This was helpful, most of tubes were either missing, smashed or in the wrong sockets. But, I still am not sure of the exact code number for this set!

Starting in 1937, Philco models were preceded by the suffix of the year they

were marketed. For example, the 37-610 was made in 1937 (the 610 model was introduced in 1936), a 38-9 was marketed in 1938. Philco used this system up until 1953.

### Proper Grounding Techniques

When you peek under a Philco chassis you will see that the block capacitors are mounted to the chassis using long No. 6 self-tapping metal screws. Some styles of Philco blocks rely on the mounting screw to provide a good ground return for condensers to the chassis. I always use new external tooth lockwashers on the tops and bottoms of all restored Philco blocks that

require a ground return. These lockwashers help to make a good low resistance ground connection to the chassis. Poor grounding can cause a myriad of problems ranging from "motorboating" — a low frequency putt-putt noise — to almost any other instability problem a receiver can develop. Problems resulting from poor ground returns are often hard to track down and can be the bane of novice restorers! In many of my larger chassis Philcos I also add a solder lug under each block, and then run a small bare wire from the block ground lug to the new solder lug mounted at chassis level. RadioShack carries small spools of bare tinned wire that is good for this purpose.

In this age of plastic boxes and circuit boards, finding solder lugs can be a bit of problem — they aren't used much nowadays. DC Electronics carries No. 6 solder lugs as their part number 904. A package of 10 costs \$1. Electronic supply houses that carry prepackaged Waldom hardware are another source for solder lugs. Use solder lugs that have the lockwasher style mounting rings. Number 6 lugs will be a tight fit, so use number 8 if you can find them.

### Philco Block Capacitor Values

Table 1 lists all of the component values used in the Philco block capacitors. I like to use either Panasonic or NTE radial lead capacitors. These capacitors are ideal "fits" for insertion into the old blocks and are reasonably priced. The radial leads are also much easier to align and thread into the rivet holes than the more expensive axial lead versions. Use insulating spaghetti over capacitor leads that have close spacing. "Spaghetti" is an old radio lingo for insulating varnish-impregnated cambric tubing.

I have listed the closest available replacement values for Panasonic and NTE 630-volt Mylar capacitors in the table. Panasonic E-series or ECQ-E metallized polyester caps in 630 volt ratings may be ordered from Digiquey. NTE components may be mail ordered from Hosfelt Electronics, or are available at many major electronic supply houses.

The NTE capacitors are carried in the MLR 630 volt series. For example, for a .05 mfd NTE replacement you would order the 630-volt MLR 503 capacitor. The 503 is a way of showing the capacitor value. The first two digits being the value, and the last digit, the 3, being the

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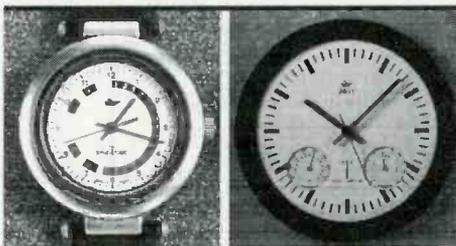
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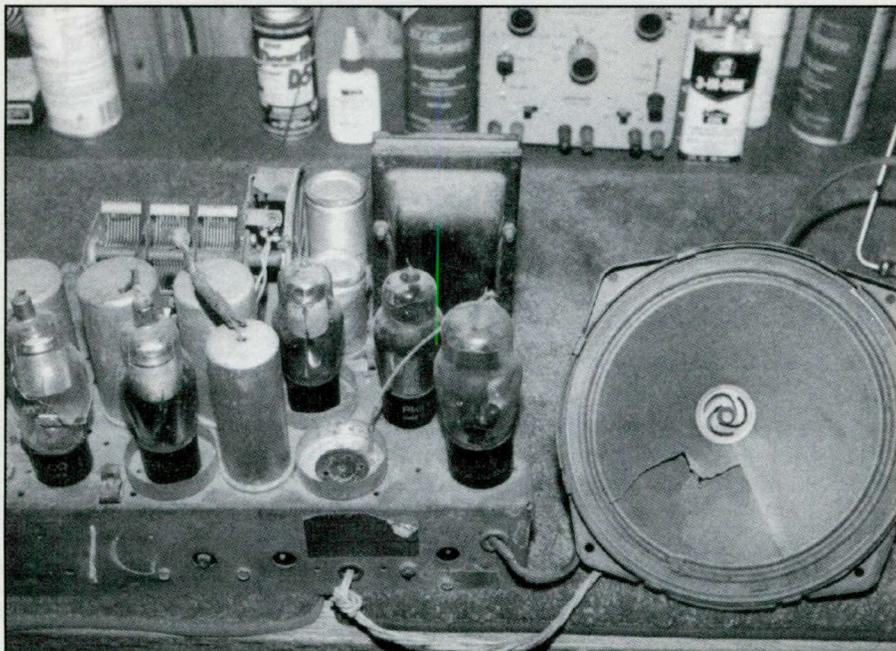
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*A view of the unrestored Philco 89 chassis.*

number of '0's, or decade multiplier. The marking scheme is in pF (picoFarads, or mmfd). Thus the 503 equates to 50,000 pF, or .05 mfd.

Table 2 shows the original capacitor values and the suggested replacement values for the early style Philco block capacitors used in the model 89 cathedral. I had originally planned on using the information presented in Rider volume 3 for the 89 chassis block capacitors. Not surprisingly, the actual blocks used in my chassis differ from what is shown in the Rider parts tables. Rather than show the terminal connections for the replacement caps, which is rather confusing, I have labeled the rivet holes as follows: connection "A" is the rivet hole closest to the mounting screw, B is the center rivet, and C for the outer most terminal.

Those old capacitors had wide tolerance ratings, so you have some leeway in choosing replacement values. Don't be afraid to use a next larger value for a capacitor used for coupling or bypassing. For example, where a .09 mfd was used, a .1 mfd will do fine. Likewise, a .056 or .047 may be used in lieu of a .05 mfd capacitor. For oddball values like 700 pF (shown as .0007 mfd) two .0015 mfd caps in series will serve as a replacement. The block condensers used after the detector to remove residual traces of the IF carrier usually houses two 110 pF capacitors (.00011 mfd) in a simple RC lowpass filter. This is the 8035-C block in the 89 chassis. These blocks may contain either paper or mica Aerovox brand 110 pF

molded capacitors. If you can determine that the capacitors are molded mica, they may be left in place. This is a low voltage point in the radio, and these capacitors are not prone to failure. Otherwise, I suggest replacing them with either ceramic disc or dipped mica capacitors with a 100 volt rating. Some other blocks contain values in the high pF range (i.e. .00025 mfd), these should be replaced with disc ceramic caps with a 1000 Vdc rating.

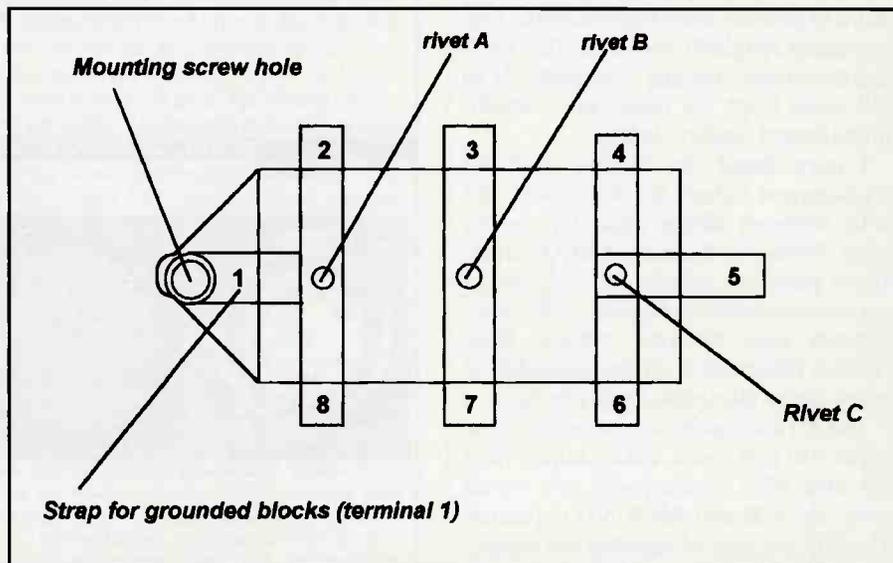
The two or three letter suffixes following the four-digit part number offer some clues regarding the internal components. For example, if the last letter is a "G" then the mounting hole supplies a ground for

terminals 1, and/or 2 and 8. A "U" signifies no ground. The second letter is usually either a "S" or "D," this signifies whether the block houses a 'S'ingle or 'D'ouble capacitor. A first letter "O" in the suffix denotes either a special high-temperature tar mix, or that a special high-temperature sealing wax used on the paper capacitors. For example, a Philco block, part number 3615-ODG, would contain two .05 mfd capacitors with a common ground return via terminal one, and is designed for use near high temperatures.

Figure 1 shows the outline of all of the possible terminal connections that can be made on a Philco block. Terminals 2 and 8, terminals 3 and 7, and terminals 4, 5 and 6 are always the same electrical connection. There is a maximum of three electrical connections on any style block. For some models, the rivet connection for terminals 2 and/or 8 may be electrically strapped to terminal 1, which is the ground return connection, via the mounting screw, to chassis ground. Whether the "left" or "right" side terminals are present depends on the particular block condenser. Sometimes terminals are present that are not connected to internal components — these were provided as simple tie points for additional wiring, or to connect to external components for those blocks that held a single capacitor.

### When NOT To Substitute Next Values

Do not substitute values for capacitors used in resonant circuits in the RF or IF stages. These will be usually be mmfd, or



*Outline drawing of the Philco block condenser housing shows terminal designations.*

**Table 2 - Philco Block Capacitors Used In The Author's Philco 89 Chassis**

Philco Part No.	Philco Cap Values	Nearest Replacement Values
8035-C	110/110 pF	110 pF (AB), 100 pF (AC)
8174-B	.05/.0007	.05 (AB), 700 pF (AC)
3615-E	.05	.05 or .047 (AC)
3615-L	.05	.05 or .047 (AC)
3793-E	.015	.01 (AB) .01 (AC)
3903-T	.01	.01 (AB)
3903-AB	.01	.01 (AB)
4989-W	.09/200-ohm	180 (AB) 0.1 (AC)

Note: Caps in 3793-E must be rated for AC line bypass service. "A" is rivet nearest mounting screw, "B" is center rivet, "C" is furthest rivet. For example, .05 (AC) indicates the capacitor is connected across the A and C rivets.

pF, values, and are usually molded mica or molded paper capacitors in vintage sets. Also, it is best to use capacitors close to original values in tone control circuits.

To handle any block style you might encounter, you will to have a number of capacitor values on hand. These values are fairly typical of those used in other radios from this era, not just Philcos. I suggest only stocking and using 630-volt capacitors for replacements. The additional cost is minimal, especially considering the bulk pricing advantages, and not having to stock each value in three or four voltage ratings!

### More On Capacitor Voltages

We have shown how power supply voltages can be much higher than expected when a radio is first turned on. These early sets used rectifier tubes that used the filament wire as the cathode (directly heated). The rectifier would be working long before the rest of the radio tubes using indirectly heated cathodes warmed up and began drawing current. Often the screen grids are bypassed with capacitors rated for the typical operating voltage of the screen. A tube in the IF stage with 225 volts on the plate may require a screen voltage of 95 volts. To save a few pennies, the bypass capacitors for the plate might be rated for 400 volts, while the screen bypasses may only have had a 200 volt DC rating. For example, Philco may have used a 6287 series block for screen bypassing, the capacitors in those blocks carry a 200 working voltage rating.

The lower screen voltage was often supplied by using a "dropping" resistor from screen to the plate voltage potential.

If the screen normally draws 2 mA (.002 amps) at 95 volts, Ohm's law shows us that to drop 130 volts (225 volts to 95 volts) we would need use a series dropping resistor with a 65,000 ohm rating, ( $R = E/I$ ). Using the power formula  $P = I E$  shows the resistor will dissipate .26 watts, so a 1/2 watt resistor would serve here. But, here's the "rub!" The rectifier warm up time is almost instantaneous, and B plus voltage will be delivered to the tube

elements before they begin to draw current. If the screen supply voltage is being developed across a dropping resistor, the screen bypass capacitor will be subjected to the full surge DC supply voltage for several seconds!

Subjecting capacitors to momentary overloads may have been standard engineering practice 60 years ago, but as restorers we are more interested in doing things properly than in saving a few pennies. Always use 630-volt capacitors and you won't go wrong.

The replacements used for the 3793-E block condenser in the model 89 set must be capacitors rated for AC line bypass service. These Panasonic disc ceramic capacitors are offered by DigiKey. It's OK to use .01 mfd discs in .015 mfd block condensers used for AC bypassing.

### Color Codes and Resistors

Most electronic catalogs have tables listing the values for modern 10-percent tolerance resistor values. For restoration work you will probably want to stock an assortment of the values above 100 ohms. RadioShack offers a small kit of 1/2 resistors, as does DigiKey. Early sets used 20

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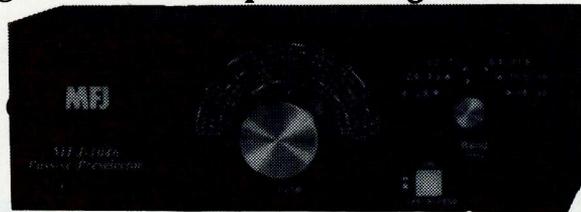
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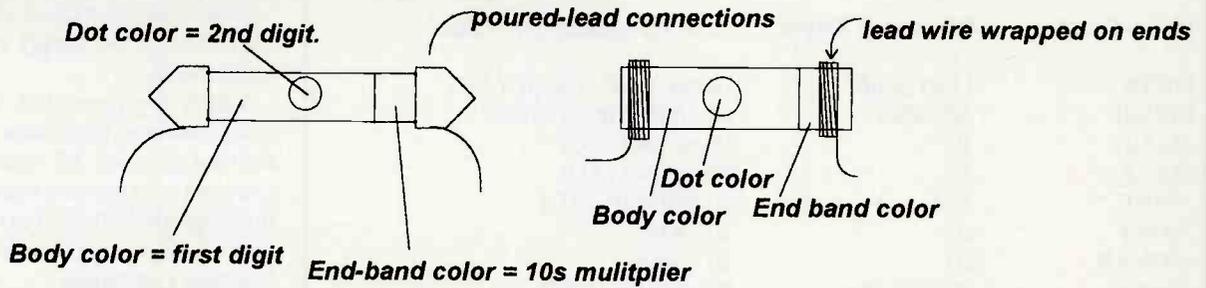
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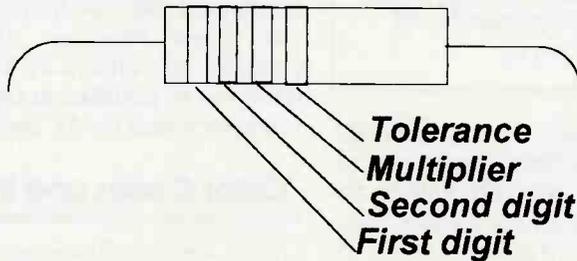
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## Body-End-Dot method of marking early resistors.



## Color band system used on modern resistors.



Color	Figure	Multiplier	Tolerance
Black	0	1	Gold=5%
Brown	1	10	Silver=10%
Red	2	100	No 4th Band=20%
Orange	3	1000	
Yellow	4	10,000	
Green	5	100,000	
Blue	6	1,000,000	
Violet	7		
Gray	8		
White	9		

*How to read the resistor color codes on vintage and modern resistors.*

percent tolerance resistors as a rule, but some of the early values do not have exact 20 percent modern equivalents. They may actually fall on values reserved for modern 5 or 10 percent components values, but they can be replaced by the nearest standard value 10 percent resistor

without problem. Resistors do drift higher in value with age. I have measured many vintage resistors in working radios and found they have aged and reached values as much as 100 percent higher than they are marked.

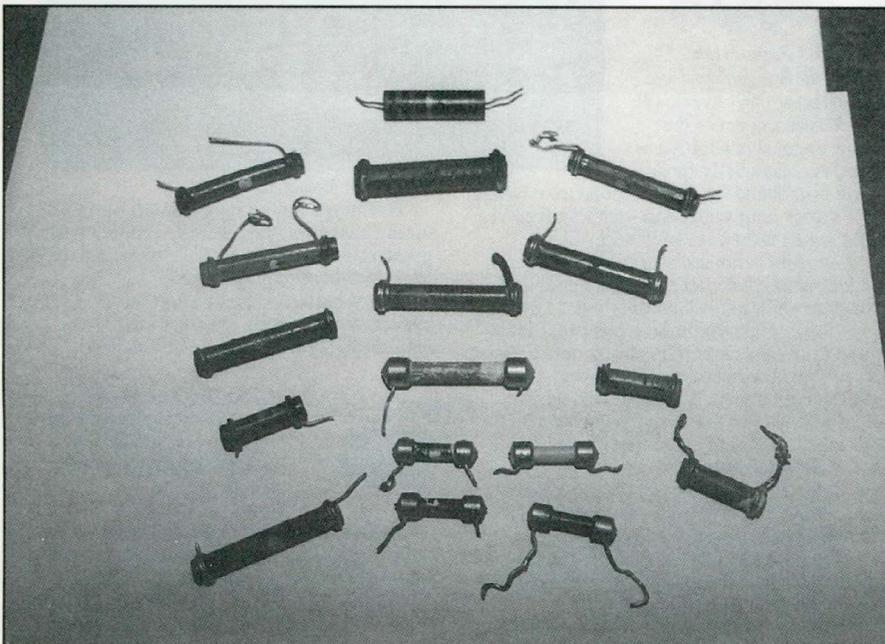
The resistors used in the Philco blocks

may be replaced with 1/2-watt resistors. Carbon 10 percent tolerance 1/2-watt resistors are cheap; they generally run about 2 or 3 cents each when purchased in quantity. I keep a few hundred of each 10 percent value on hand. RadioShack carries 1/2-watt resistor assortments that are very reasonably priced.

Figure 2 shows the color codes system used for marking resistors and how to read the color bands on modern resistors and vintage resistors.

Where modern resistors use sequential color bands for marking, resistors prior to 1940 used the resistor body color, an end color, and a colored dot to indicate the resistance. Some of these fellows use molded lead end caps to attach the leads. Remember the acronym BED — Band, End, Dot — to read these fellows. For example, the Philco 89 uses two 70K-ohm (70,000 ohms) resistors. These 70K resistors are marked with a violet body, black end band, and an orange dot. The color code chart shows that the violet body color represents a 7, the black end-band color is 0, and that orange dot stands for a decade's multiplier of 3, or 3 zeros.

Table 3 shows the resistance values and color markings for a sampling of some of the resistors used in the 89 chassis. Remember that these early resistors did not have a color band to indicate their tol-



*These are a few of the early resistor styles you will find in vintage sets.*

**Table 3 - A few examples of resistors used in the Philco 89 radio**

Value in Ohms	B-E-D Colors	Replace With
5,000	Green/Black/Red	4,700
8,000	Grey/Black/Red	8,200
10,000	Brown/Black/Orange	10,000
70,000	Violet/Black/Orange	68,000
1,000,000	Brown/Black/Green	1.0 megs
2,000,000	Red/Black/Green	

**Table 4 - The Corrected Ohm's Law and Power Formula Tables**

$I = \sqrt{P/R}$	$P = E^2/R$	$R = E/I$	$E = IR$
$I = P/E$	$P = I^2 R$	$R = E^2/P$	$E = P/I$
$I = E/R$	$P = EI$	$R = P/I^2$	$E = \sqrt{PR}$

erance ratings. Table 3 also shows suggested replacements based on modern 20 percent tolerance values.

Despite the large size of some of the resistors shown in the photo, the biggest ones have only a 3 watt dissipation! Most of the smaller sized resistors are 1/4-watt. If in doubt, the Rider's parts lists usually indicate the resistor wattages along with the resistance value. Use 1/2 watt resistors to replace those early 1/4 watt units. For resistor wattages above three watts, use wire wound resistors as replacements. Some manufacturers, notably Atwater Kent, had their own color code for marking resistors used in their radios. We will show examples when we cover AK sets in detail.

## Errata

Well, we covered a lot of ground this month! I am heading back to the workbench to do some more work on the two Philcos so I will have some progress to report in our next column. Before we go, I must sincerely apologize to you folks the technical errors I made in the October 1997 Radio Connection column. First, I am reprinting the table showing the variations of Ohms Law and the Power formulas that ran in the October 1997 column — at least two of those formulas were wrong. On page 30, for a 110 Vdc plate supply, the screen current should have been 4 mA, not 2 mA as I stated, for a total cathode current of 51 or 53 mA. Also, on page 31 where we used Ohms law to solve for the unknown value of the cathode resistor, the text should have stated that the unknown Resistance could be found by dividing the Voltage V (8 volts)

by the cathode current I (.052 mA).  $R = E/I$ . Or,  $R = 8/.052$ . The correct answer is 153.8 ohms (not 123 as shown), for which a 150 ohm standard value resistor would do fine. Thus, the solution for wattage should have been  $P = I E$ , or .42 watts, (not .52 watts as shown). The 25L6 tube data was taken from the 25L6GT columns — it was pointed out to me that there are some slight electrical differences between the metal and glass (GT suffix) versions of the 25L6. ■

## Radio Restoration Resources

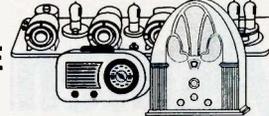
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# Antennas & Things

BY JOE CARR, K4IPV  
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SIMPLE ANTENNAS AND ACCESSORIES FOR SIGNAL IMPROVEMENT

## The Regular Dipole and the Shortened, Loaded H.F./L.F. Dipole

Some antennas last forever. The half wavelength, horizontal dipole antenna is a long-time favorite for both shortwave listeners and ham operators. It is probably the most widely used resonant antenna among all groups of radio enthusiasts. My first effective antenna (we won't talk about my first attempt!) was a half wavelength 40-meter dipole that was more or less horizontal ("more or less" because one end was supported by the railing on the roof of my parent's porch, and the other in a tree). That first antenna went up in 1958. If I wanted to put up a quick and easy antenna for a single band today, it would most likely be a dipole.

Dipoles work well. They are also easy to build, and don't cost an arm and a leg. Indeed, when you are scraping the bottom of the barrel marked "\$\$\$\$\$" (as I often did as a kid) a dipole is one possible alternative.

By the way, to satisfy one critic who called me to task over terminology, I know that any antenna with the radiator fed at the center is technically a "di- (two) pole" antenna. He wanted me to spell out half-wavelength horizontal dipole every time I used it. Well, I recognize his point, but for sake of simplicity, if I use the term "dipole" in this column without qualifications, then what I mean, with great

specificity, is "half-wavelength horizontal dipole."

### A Look at the Basic Dipole Antenna

Figure 1 shows the elementary dipole antenna. The overall length is half wavelength at the frequency of operation. That means the dipole is a resonant antenna, so will work well at the design frequency, and nearby frequencies, but works less well (or not very well at all) at frequencies far removed from resonance. The resonant point is also the point of minimum VSWR.

The antenna radiator elements are each a quarter wavelength long, and are usually made of No. 14 or No. 12 stranded Copperweld or hard drawn copper wire. The ends are supported by an end insulator (EI) and possibly a rope to a supporting structure.

The coaxial cable from the receiver is connected at the center of the overall antenna, i.e. the adjoining ends of the elements. A center insulator or BALUN transformer is used to support the ends of the antenna and the coax. In some cases, you might want to use a special center insulator, although an ordinary glass, plas-

tic or ceramic end insulator will also work as the center insulator. The best solution is to use a 1:1 BALUN coil at the feed-point (it will double as a center insulator).

The use of a 1:1 BALUN transformer should be considered. It makes the patterns of the antenna you build conform more closely to the patterns you see in books and in our Fig. 2. The purpose of the BALUN is to prevent current flowing in the coaxial shield from contributing to the radiation pattern. I consider a BALUN a necessary part of a dipole, even though the antenna will work without one.

The normal equation for overall length (B) would be  $492/F$ , when F is in megahertz (MHz) and B is in feet. But, because of the "end-effect" caused by the insulators, and the velocity factor (VF) of the wire used for the radiator, there is a 4 to 6 percent shortening taking place, especially close to the Earth's surface. This means that the overall length (B) should be found from:

$$L_{\text{feet}} = \frac{468}{F_{\text{MHz}}}$$

For example, consider an antenna cut for a frequency of 9.750 MHz, i.e. in the 31-meter shortwave band. The length of

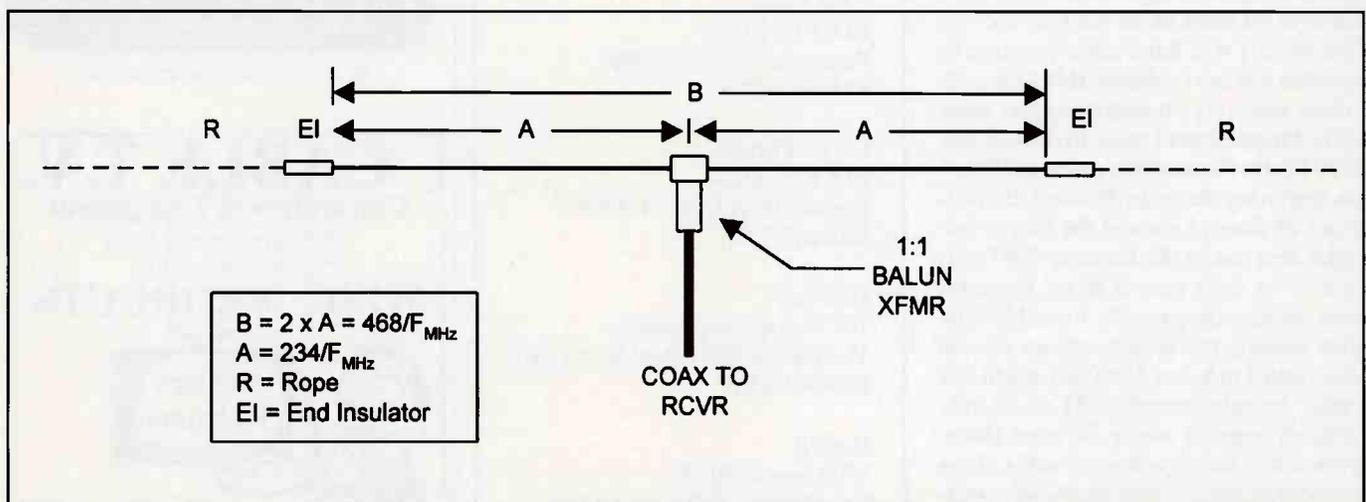


Fig. 1: Standard, full-size half wavelength dipole antenna.

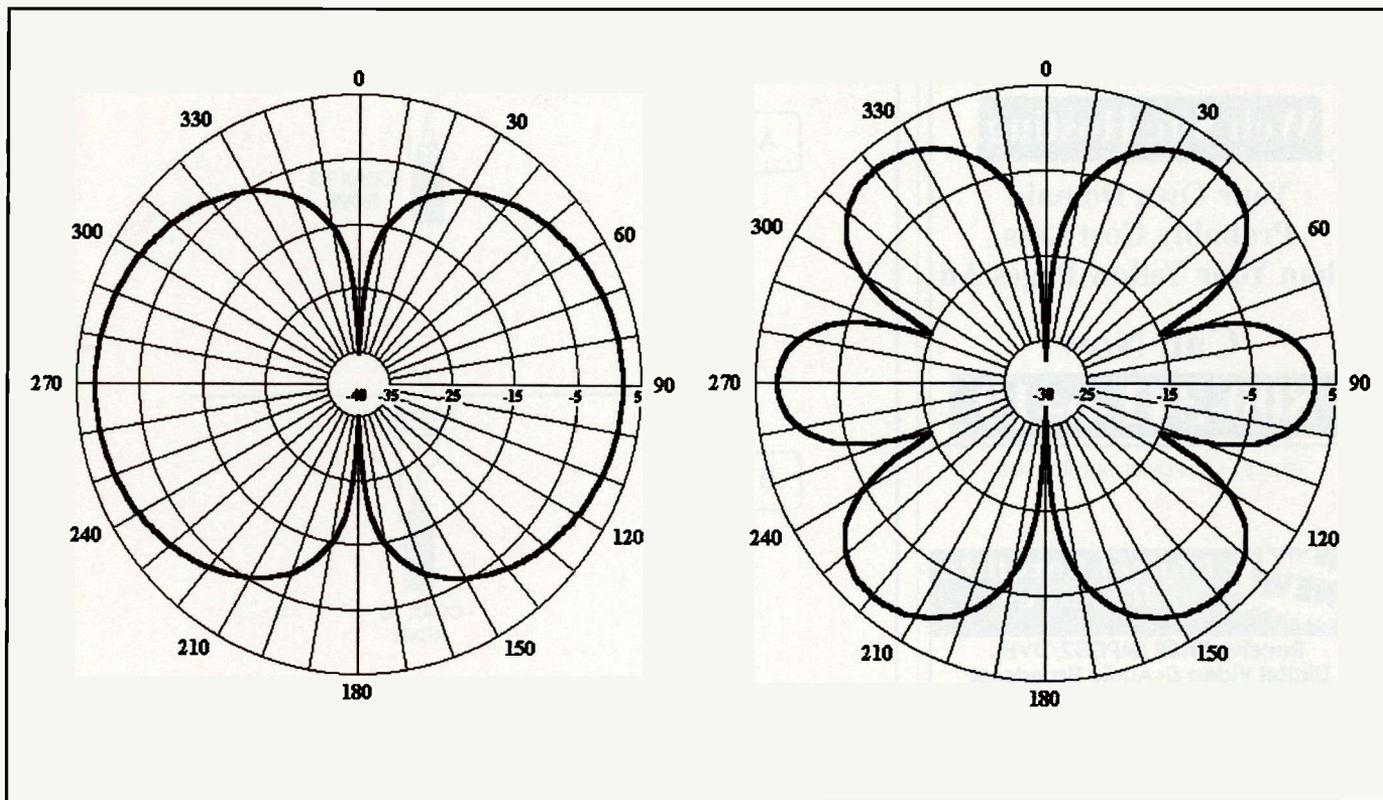


Fig. 2A and 2B: Dipole azimuthal (horizontal) patterns: A) at design frequency, B) at 3X design frequency.

the two radiators together are  $468/9.750$ , or 48 feet. Each element has a length ("A") of one-half the overall length, or 24 feet.

One neat thing about the dipole is that it can be used on odd multiples of the design frequency. As a young ham operator I routinely used my 40-meter (7-MHz) Novice band dipole on the 15-meter novice band (21-MHz). It's not for free, however. **Figure 2A** shows the azimuthal (i.e. horizontal) pattern for a 48-foot overall, 9.75-MHz dipole at its design frequency, and **Fig. 2B** is the same antenna at three times the frequency (29.25-MHz). The pattern at 3X the design frequency becomes a four-stem "clover leaf" pattern.

A 48-foot antenna is not too terrible for most people who live in single-family dwellings. But even a 31-meter band antenna may be too large for someone in a townhouse (where homeowner's association rules make attic or indoor antennas mandatory), rowhouse or apartment (where the antenna must be indoors). When you get down to, say, 4.250 MHz, then the antenna length becomes 110 feet, with each element being 55 feet. This antenna is a good performer on the medium wave bands if you have the space. A dipole for the 60 to 80 meter bands strains the limits for a great many residences.

## The Shortened, Loaded Dipole Antenna

But there is a solution, although it doesn't have quite the gain or bandwidth of a normal dipole antenna: the shortened, loaded dipole antenna (**Fig. 2**). Several varieties are presented.

The antenna in **Fig. 3A** uses a center-loaded element that is shorter than half wavelength. The center conductor of the coaxial cable is connected to the center of the coil, while the coax shield is connected to a tap on the coil that matches the impedance of the coax. In **Fig. 3B**, the antenna is also center loaded by coil L1, but the coil is actually an impedance matching transformer with L2 being the secondary winding. The ratio of the number of turns in L1 to L2 determines the impedance ratio.

Two approaches that are more conventional are shown in **Figs. 3C** and **3D**. The version shown in **Fig. 3C** places the loading inductors right at the feedpoint, back-to-back. These coils are said to be a "0-percent of overall length."

The value of the inductance of coils L1 and L2 are equal, and are a function of two factors: 1) the overall length of the antenna as a percentage of a full-size, half

wavelength dipole, and 2) location of the coils as a percentage of element length.

**Figure 4** shows a graph for finding the approximate value of the inductive reactance for L1 and L2. The vertical axis represents the coil reactance in ohms, while the horizontal axis represents the coil location as a percentage of element length. For example, when the value "0" is used, the coils are located at the antenna feedpoint, but if the "50" value is used, the coils are located at the mid-point of each antenna element.

Three different curves are plotted on **Fig. 4**: curve "A" is for an antenna with an overall length that is 10 percent of the correct half wavelength size; curve "B" is for a half-size (50%) antenna; curve "C" is for an antenna that is 90 percent of full size. Consider our 4.25 MHz antenna. Recall that a half wavelength antenna is 110 feet long, with two 55 foot elements. The antenna for curve "A" would be  $(0.10)(110 \text{ feet}) = 11 \text{ feet}$ . The antennas for "B" and "C" are 55 feet (with 27.5 foot elements) and 99 feet (with 49.5 foot elements), respectively.

In general, the best solution is to use the longest antenna possible. If you can put up a full-size, half wavelength antenna, then do it. But if you can't then put up the longest shortened dipole that you can.

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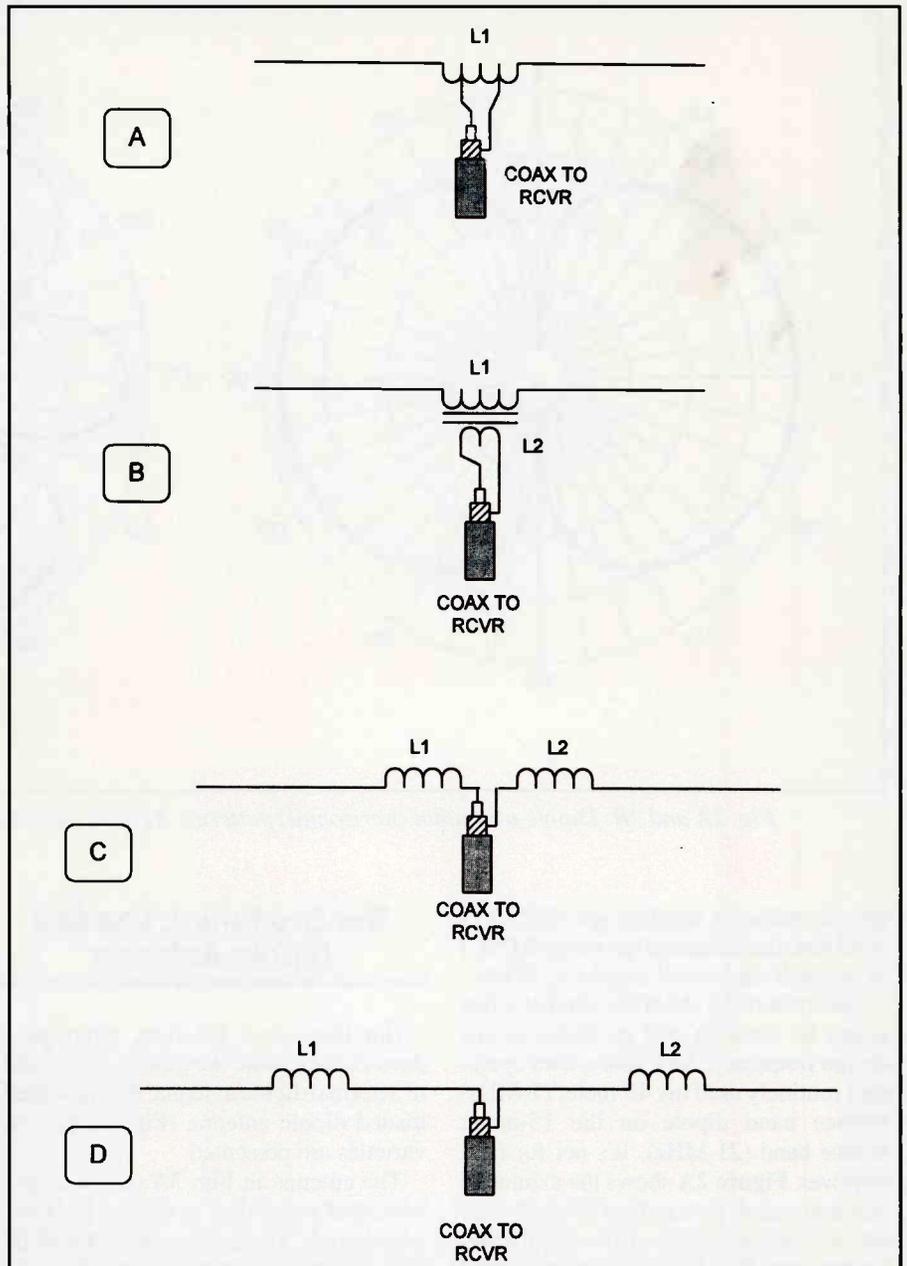


Fig. 3: Shortened dipoles: A) tap coil matching; B) transformer matching; C) coils at zero-point; D) coils at other points on the antenna elements.

The shorter the antenna, the less the efficiency and the narrower the bandwidth. For sake of an example, let's make an antenna for 4.25 MHz that is 50 percent of full-size, or 55 feet long (27.5 foot elements). We will put the inductors at the 50 percent point, i.e. in the middle of each element (Fig. 3D). The coils are therefore at 27.5/2, or 13.75 feet (13' 9") from each end of the elements.

The inductance required of L1 and L2 is found by following the 50 percent point from the horizontal axis until it intersects the 50 percent curve ("B"), and then looking to the left on the vertical axis for the value. In this case, the value of the coil is

about 950 ohms. The inductance value can be found from:

$$L_{\mu H} = \frac{X_L(\text{ohms})}{2\pi F \text{ MHz}}$$

Where, inductance  $L_{\mu H}$  is in microhenrys ( $\mu H$ ),  $F_{\text{MHz}}$  is frequency in megahertz (MHz), and  $X_L$  is the coil reactance in ohms ( $\Omega$ ). For our case, with  $X \approx 950$  ohms, and  $F = 4.25$  MHz, the inductance will be:

$$L_{\mu H} = \frac{950\Omega}{(2)(3.14)(4.25)} = \frac{950}{26.7} = 36\mu H$$

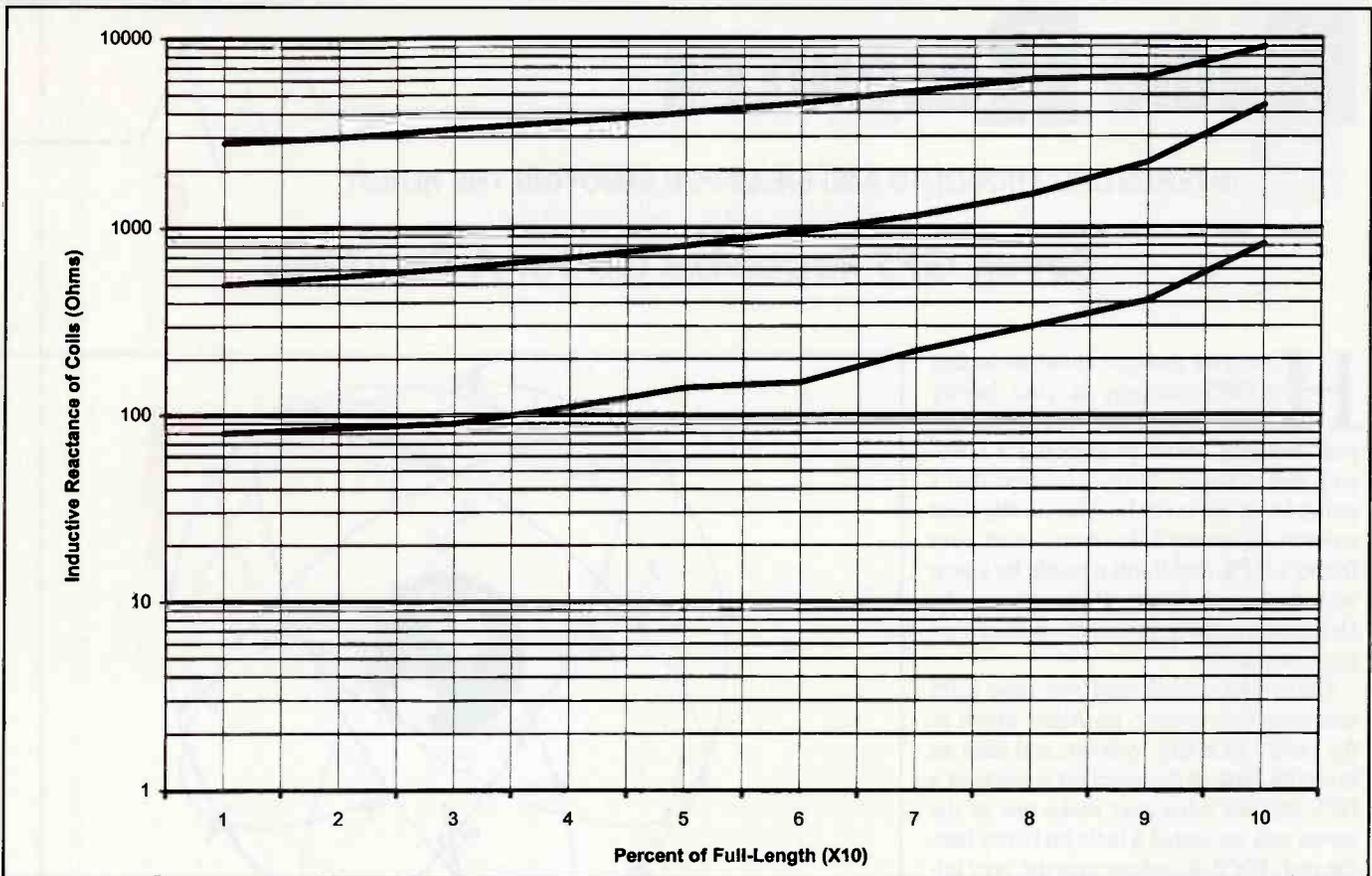


Fig. 4: Graph for finding coil reactance.

We can wind or find a 36  $\mu\text{H}$  coil and all is right, right? Wrong, or, rather, maybe. The graphs is an approximation, so some work with a grid dipper or VSWR analyzer is in order to trim the coils or the antenna length to find resonance.

Does the shortened, loaded dipole work as well as a full-size half-wavelength dipole? In a word: no. But that's not the relative factor here. What's relevant is what can you put up in the space allowed. The shortened, loaded dipole will serve as a good antenna in spaces where full-size antennas are not possible, at a cost of some performance and bandwidth.

Ready-made coils and kits for these antennas can be found at nearly all short-wave supply houses. These kits are generally pretty good, and will eliminate a lot of the guess work. Lots of luck. I've been (and still am) space-limited for antennas, so appreciate any technique that allows a good solution.

### New Book

My new antenna book, Antenna Toolkit, is out. This book is about wire antennas, and includes a software CD-ROM. The CD-ROM has a version of my

Antlers III program, plus propagation prediction software and a DOS version of an antenna modeling software program (an older version of the Navy's mini-NEC). Antenna Toolkit is published by Newnes, an imprint of Butterworth-Heinemann (225 Wildwood Avenue, Woburn, MA 01801-204, Phone: 1-800-366-2665). Newnes is a UK publisher, but has a presence in the USA. You can order the book by calling the 1-800 number, or through Amazon Books <<http://www.amazon.com>>.

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### January Gremlins

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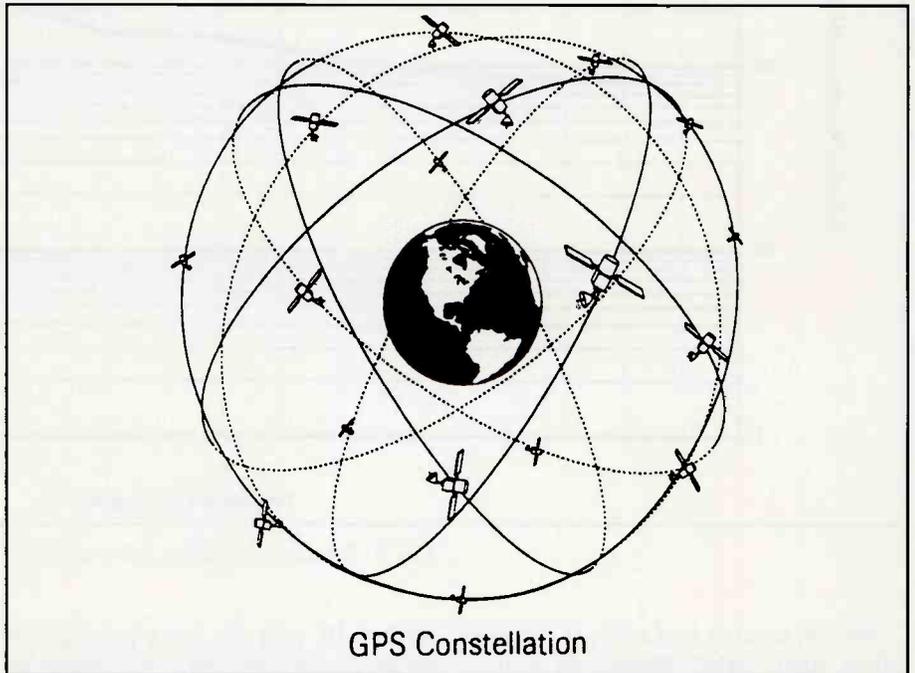
Let's take a look and see how GPS receivers can resolve positions down to the radius of a fire hydrant, and take an in-depth look at the receiver section of a GPS and see what may make one of the seven sets we tested a little bit better than the rest. We'll also show you the very latest in gee-whiz technology where roadways have been pre-loaded into the new generation portable GPS equipment so you can watch yourself travel all over your screen's highways for under \$370.

### Just What Is GPS?

GPS stands for Global Positioning System. The Department of Defense just celebrated the 10th birthday of one of the first GPS Navstar satellites. The GPS satellite constellation has 24 satellites plus about three spares orbiting the earth twice a day at an altitude of 12,000 miles. These satellites are in six orbital planes, four satellites per orbit.

If you live out in the open country, a clear shot to the horizon and everything up above you could lead to the signal reception of eight satellites or more. If you live in the city, you can easily pull in five or six satellites at once. In downtown areas, your GPS receiver may only "see" three or four satellites that are just about overhead.

Our Global Positioning System satellites transmit code division multiple-access (CDMA) at a civilian frequency of 1575.42 MHz. This is frequency L-1. The military can also receive the additional L-2 frequency channel, 1227.60 MHz, but this channel is encrypted for



*The GPS satellite constellation has 24 satellites plus about three spares orbiting the earth twice a day at 12,000 miles.*

military use only. But not to worry, reception of the L-1 channel will be plenty accurate enough for us to really get some good position information out of our tiny GPS receiver.

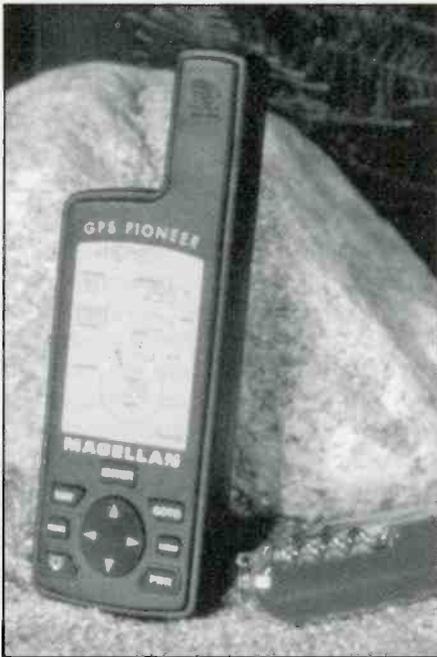
You can forget about trying to hear the signals at 1575 MHz with your little portable scanner or a massive ICOM full-coverage VHF/UHF receiver. You won't hear anything. The signals are spread spectrum, and are so low in the noise that it takes a special GPS receiver decoder to extract the clock information necessary for a three-satellite position fix.

### How Do I Get A Fix?

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GPS receiver can begin to find itself on earth by measuring the distance to each individual satellite known to be at a specific place in their orbit. The distance calculation is based on the velocity of radio waves in space and in our ionosphere and atmosphere. The GPS computes time delays (called trilateration) to all satellites it can see above the horizon, internally computes and doublechecks each satellite's position in space, and then converts this time delay into meaningful latitude and longitude coordinate numbers displayed on the screen.

Just before your little GPS begins showing latitude and longitude, or a picture of your car traveling down the highway, it goes through two additional steps to make the position readout more accurate. Step 1 is to throw out a ridiculous calculated position that puts us just as far away in space as it would sitting on or near earth. Keep in mind this is a three-dimensional positioning receiver, and we



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could actually receive the same time delays both down here on earth as well as out in deep space. Your receiver chucks the deep space calculation.

The receiver also self-eliminates clock error when keeping track of the time. The satellites use an onboard clock with an atomic reference to be spot-on. Your receiver runs on a clock that's just a little cut above a Timex™. A slight clock error in every one of our receivers may give us a cluster of satellite range calculations that simply don't match up as one single dot at a spot on the earth. Your GPS receiver will add or subtract just a little bit of micro-time to each calculation; and when the dots all come together, clock error has now been nullified. Remember in algebra "4 equations and 4 unknowns"? The same principle applies here, but it's done automatically in your little \$99 receiver, and you end up with a position fix.

### How Accurate?

The Department of Defense will guarantee us a position fix within the radius (center out) of a 300-foot circle 90 percent of the time. Yikes! 300 feet in any direction is a big error. Why can't we do any better? One reason is the military has induced "Selective Availability" which slightly moves our signal around in this circle to prevent unfriendly forces from

being able to use our civilian L-1 channel to drop the big one right down the stack of a nuclear reactor. The way I see it, if they drop the big one and miss by 300 feet, we are still in deep trouble!

Selective Availability accounts for about 170 feet of continuous error. However, if you just hold your position for just a few minutes, your GPS will begin to figure out that this error is regularly moving around the screen, and will graphically show you where the true posi-

tion is by multiple intersections of your traveling position lines. Now we are down to an accuracy of just a few meters. But you've got to be standing still for this one.

There are also inaccuracies within the system due to ionospheric delays when these microwave signals pass through heavily charged particles of our ionosphere at low angles. This causes a slight delay in signal reception, so inaccuracy of another 50 feet or so can be blamed on Mother Nature.

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Model R-T shown



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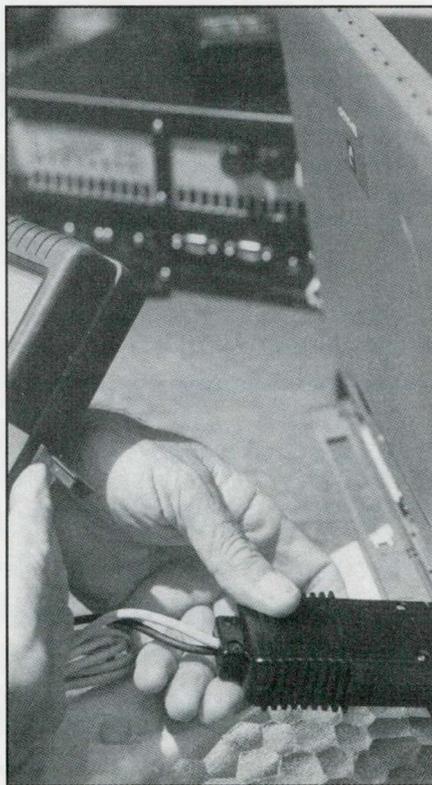
CIRCLE 79 ON READER SERVICE CARD

### **Tuning In** (from page 4)

today we're using the power of the computer to *enhance* our monitoring, not replace it. Sure, the Internet is a powerful force that has certainly had profound impact on the radio hobby, from ham radio to scanning and CB, but when the Internet and computer fever breaks in the coming months, and as propagation improves in the new solar cycle, I bet you'll see all those Internet junkies returning to radio's ranks to re-capture what was missing in their lives.

### **The BCB Is Alive and Well!**

This month Joe Cooper will rekindle our interest in broadcast band DXing. His article, "Setting Up A Successful Broadcast Band Monitoring Station" is just what you've been asking for in your cards and letters; more broadcast band coverage and how-to articles. Be sure to pick up next month's *Pop Comm*, for the second part of Joe's special article when he'll give you step-by-step instructions on building your own passive loop for broadcast band monitoring. And oh, yes, next month he'll also share some interesting Internet Web sites that'll *enhance* your broadcast band monitoring.



*A GPS output to computer loaded with street maps.*

But soon most of these errors will be a thing of the past through the use of differential reference stations. In fact, if you live near oceans or lakes where there is a lot of commercial boat traffic, chances are you can tap into the low-frequency spectrum and receive a differential position correction via minimum shift keying (MSK) that can spot you down to one side of the street or the other. This is a free differential reference signal from the United States Coast Guard.

If you're into surveying, you can also receive reference signals from FM and television subcarriers. This costs you about \$50 a month, but the accuracy can now get you down to the fire hydrant level. And for surveyors, they set up their own differential reference stations, and can get you down to the radius of a thumb tack. Close enough?

### **How Many Channel Receivers?**

Most modern GPS receivers now offer 12-channel parallel reception. Same frequency—but each satellite has its own pseudo-random code, and the latest generation of receivers can simultaneously lock onto 12 separate channels of 12 sep-

arate codes from 12 separate satellites for the most accurate and quick from turn-on reception ever. Look for equipment with 12 parallel channels of reception if you demand a quick turn-on fix. However, even with less channels through multiplexing or sampling, that little \$99 Magellan receiver will still give you just as accurate a fix as the 12-channel receivers that are three times as expensive. The big difference is how long it takes for the unit to acquire a position fix from a cold start, and how well the GPS will hold onto the position updates when you get into an area of poor reception—an area of tall buildings blocking your view to the satellites, or a tree-lined road where foliage will literally suck-out usable signal strength from those satellites not straight overhead.

### **The Fantastic Receivers!**

For \$99, you can buy a GPS that will give you turn-on position readouts within 60 seconds, and one-second updates for under \$99. It's called the Magellan Pioneer, and it's offered at most chain stores throughout the country. It reads out latitude and longitude, plus speed and direction of travel, plus a whole bunch of other things, and is just as accurate as other GPS receivers that are three times the money. Use this little receiver with a road atlas that has latitude and longitude, and you are all set. But you'll need to bring along a pair of dividers to do your calculation; and unless you work a lot with maps and charts, going from latitude and longitude over to a real position fix is sometimes a hassle.

But this little GPS also keeps TRACK of where you are; and if you want to get back to where you've been, just watch the little plot on the screen. Or, if you know exactly the latitude and longitude of where you are going, this unit will tell you the way, and count down the miles.

The Magellan does a ton of other things, too, but a couple of things that it won't do for its \$99 price is tie into a laptop computer running a mapping program, nor will it display maps on the GPS screen.

For around \$229, you can buy many GPS sets that have a "NMEA" data output. This could allow you to use the portable unit strictly on its own, or to tie it into a laptop computer that is running a mapping program. Now you see yourself as a blinking "X" on the screen, going up and down the little tiny surface streets. Boaters might hook it into their laptop and



No cartridge is necessary for built-in maps here.

run marine charting programs and see themselves going between sand bars and bell buoys. Pilots can plug into aeronautical charts and watch themselves on the screen going between one air corridor and another. You get the idea.

You can also buy relatively inexpensive

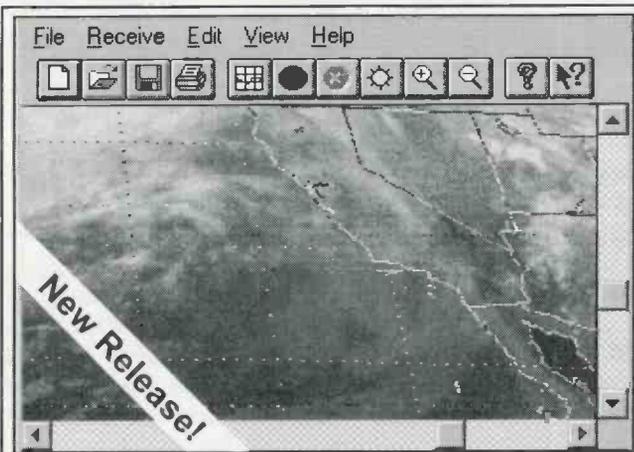
(under \$300) GPS systems that plug directly into your computer, and do away with the latitude and longitude tiny-screen readout completely. In other words, they are designed specifically, and only, for a laptop computer on the road or at sea.

Mariners and pilots also have portable

GPS equipment that can take "map chips" for local cartography that appears on the screen without the need to drag along a laptop computer. Simply insert the cartridge, push the "map" button, and voila, here you are in the local harbor, or up in the sky above a busy airport, or maybe see yourself traveling down the local interstate. And then MOST recently, manufacturers have figured out a way to permanently imbed road maps inside of little portable GPS sets where you don't need any chart cartridges AT ALL.

So we brought in each one of these portable and semi-fixed GPS sets that have the capabilities of working with road maps on a chip, or working with their own road-mapping information, and we took them for a drive around different parts of the country to see how each one played on its own built-in screen without any attachment to a laptop computer.

Next month we'll give you an in-depth look behind those units that are relatively inexpensive, but may be just the thing for the hobby radio user to combine radio listening and spot-on position finding. So don't forget to join us right here next month to see how these seven GPS sets worked out on the road!



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CIRCLE 63 ON READER SERVICE CARD

# Scanning The Globe

BY CHUCK GYSI, N2DUP

MONITORING THE 30 TO 900 MHz "ACTION" BANDS

## Finding The Feds and Traffic Reporters . . .

**D**o you set aside a certain time period each day or each week for monitoring? Maybe you even monitor 24-hours-a-day and it's time to consider turning off your radios, if not for your family's sake, for your own mental health! Perhaps when you listen, you jot down notes on various scraps of paper that are cluttering your listening post. Here's a thought: Consider consolidating those notes into file folders, or perhaps into your computer's memory. It sure would make it easier to find things.

When I travel, I usually carry a pad of paper and jot down all my monitoring notes from a given region. When I return home, I tear those sheets off the pad and file them in file folders. If I travel to a certain area on a regular basis, there will be a separate file folder for that area. If I travel through a given area and may only travel through it again in the future without stopping, there would be a separate folder for those notes. It sure makes it easier to find those notes the night before leaving on a trip (when I usually pack up all the radio gear).

### Fabulous Feds

Trish Ruvane of Cherry Hill, New Jersey, said she likes monitoring federal frequencies in the 162-174 and 406-420 MHz bands. However, a few agencies have proven tough for her to snag. She sent e-mail asking for information on frequencies used by the Drug Enforcement Agency, the Bureau of Alcohol, Tobacco and Firearms and the Secret Service.

To get started, you should search the 418-MHz range for DEA channels. Most simplex and repeater operations can be found here, as well as the low end of 419 MHz. ATF uses these primary frequencies: 165.2875, F1 simplex (mobile to mobile) and F3 repeater output; 166.5375, F2 simplex and input frequency for F3 and F8 repeaters; 166.4625, F4, or Treasury Common, used by all U.S. Treasury Department agencies; 165.9125, F5 for surveillance; 173.8875, F6 simplex and



*WBBM's traffic and news chopper prepares for takeoff. You can hear the traffic reporters on your scanner. (Photo by Bill Simpson)*

F8 repeater output; and 168.000, F7 simplex and F6 repeater input.

The Secret Service generally uses a set group of frequencies allocated to the White House Communications Agency. Some of these frequencies and their channel nicknames include: 165.7875, Baker; 165.375, Charlie; 165.2125, Mike; 164.8875, Oscar; and 166.5125, Sierra (primary presidential protective detail use). Most Secret Service communications are digitally encrypted, however, there still usually is a surprising amount of clear voice communications during a visit. For those with CTCSS decoders, the Secret Service uses a tone of 103.5 Hertz. Many metropolitan areas have Secret Service repeaters that operate on discreet VHF high-band frequencies for use on a statewide or regional basis.

For more information on federal frequencies, check out "*The Top Secret Registry of U.S. Government Radio Frequencies*" from CRB Research Books. Write to: CRB Research Books Inc., P.O. Box 56, Commack, N.Y. 11725, or fax to 516-543-7486. The book is edit-

ed by *Pop'Comm's* senior editor, Tom Kneitel, K2AES.

### Speedy Freqs

Ray Gromek of Ortonville, Michigan, writes in to say he read an article in *Pop'Comm* in June 1996 called "Fast Scanning Action." He recently took his scanner to Whittemore Speedway in Whittemore, Michigan, and found two active frequencies that provided good listening during a race he attended.

Speedway security was on 154.540 MHz while coordination for the announcer, safety crew and flagger was on 151.685 MHz. Ray said he also noticed that one of the drivers' families were using RadioShack Family Radio Service radios to keep in touch. Ray said that it was the first time he packed his scanner on a vacation and that he'll have to do it more often. Who can argue?

If the weather turns bad on a vacation, there's always plenty of scanning action! And you probably can tune in things as you visit places like race tracks, amuse-

ment parks and shopping malls. Don't forget to take along a copy of *Police Call*, *Monitor America* or other frequency guides that will help you find exciting frequencies to monitor.

## TrunkTrack?

Evan Scarborough, N1ZHD, a 12-year-old *Pop'Comm* reader who lives in Plainfield, Connecticut, has been saving his money to buy a scanner and almost has enough money to spend on that long-awaited receiver. He wants to know whether he should purchase a Uniden TrunkTracker or a regular scanner. He says he's studying the specs on the RadioShack PRO-90 TrunkTracker and the PRO-64 regular scanner. He lives in a medium-size town in Connecticut.

Watching how many towns, counties and states are switching to the less-crowded 800 MHz band, it's probably a good idea to consider going with the TrunkTracker. Even if your town or county isn't on 800 MHz yet, there's a good chance there is activity nearby you can tune in and get used to finding the trunking group codes. In addition, you can try monitoring business communications that are trunked and try to screen out who is using each of the specialized mobile radio (SMR) systems in your vicinity in the 861-866 MHz band.

## Antenna Builder

Joe Althoff of Kearneysville, West Virginia, says he has been into radio for some time. However, he doesn't know much about antennas. He enjoys listening to shortwave, scanners, CB and the standard broadcast bands. He says he has access to three-eighths-inch aluminum tubing and wants to construct a scanner antenna for the 30-500 MHz bands. Joe says he needs information to figure out the length of the four horizontal radials and the length for a single vertical element.

Having access to all that tubing, you may want to consider building an antenna for each band. Add a switch in the line and you can switch from a VHF high band antenna to a UHF antenna, for instance. If you need some plans, try your local library to see if they have any of the publications of the American Radio Relay League, or see if they can obtain them on interlibrary loan. You may want to consider buying one of the books, too, from the ARRL in Newington, Connecticut. While their books are geared at ham radio

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FREQUENCY (MHZ)	RELATIVE GAIN (dB)	RELATIVE POWER GAIN (%)
26.965	1.30	35
27.015	1.30	35
27.065	1.45	40
27.115	1.60	45
27.165	1.50	41
27.215	1.60	45
27.265	1.75	50
27.315	1.95	57
27.365	2.00	58
27.405	2.00	58

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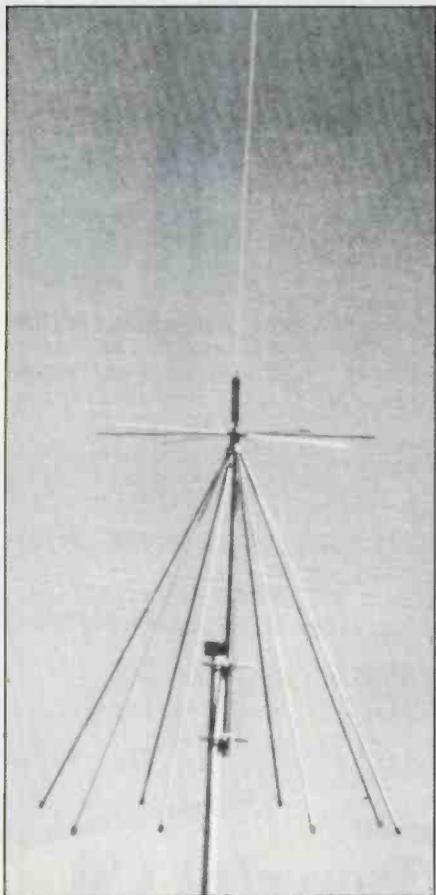
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*A discone antenna is a great choice for all-around best performance on VHF and UHF frequencies, but make sure you mount it as high as possible and use the shortest possible run of coax to minimize signal loss.*

operators, using the formulas in the books, you can cut the antenna a little shorter and change a 144-MHz antenna into a 155-MHz antenna easily.

And don't forget, the higher you mount those antennas, the better. And keep the coaxial cable as short as possible, too. If you start running more than 100 feet of cable, you're going to experience a significant loss of signal.

## Frequency Facts

Scott Walker of Santa Paula, California, says he's been scanning the action bands for about eight years now. He started with a Uniden Bearcat 172XL and his dad's old Midland crystal scanner. Then, he and his dad bought RadioShack PRO-41s. A very nice neighbor gave him his Bearcat 210 and he recently bought a Uniden Bearcat 9000XLT. Anyway, Scott sent in a bunch of questions, and we'll tackle one here.



*Many agencies are moving to the 800 MHz trunked portion of the spectrum, so purchasing a new trunk-following receiver might be a good idea. (Photo by Steve Adams)*

First, Scott asks what frequencies are used for garage door remote controls. He said he heard that 390 MHz is used.

That's true, and many do use the bandwidth around that frequency. There are other discreet frequencies in the 225-400 MHz band that garage door openers use. It's interesting to note that many car alarm remotes and remote door locks also use these frequencies.

Scott also sends in his list of favorite frequencies for southern California: 156.800, marine distress and calling, Channel 16; 155.160, search and rescue; 154.280, major fires and multiple agencies coordination; 156.075, California coordination, and some undercover police; 154.920, police coordination and special events; 154.905, California Highway Patrol mobile extenders (allows CHP officers to transmit through their car two-way radios while carrying a walkie-talkie; this offers extended coverage); 154.600, various security and McDonald's drive-through windows.

## Traffic Reporters

Ed Vickroy of Salem, Massachusetts, says he loves scanning, especially when the weather gets bad. He uses a Uniden Bearcat Trunk Tracker and wants to know where he can find the frequencies used by radio stations' traffic helicopters.

For the most part, traffic reporters in the air can be found on the following frequencies on VHF: 161.640, 161.670,

161.700, 161.730, 161.760, 166.250 and 170.150. In addition, these same units might show up in the 450-451 or 455-456 MHz bands. If you search the 450 or 455-MHz bands, you may hear the copter or plane on more than one frequency. For instance, if you hear the same unit on the air at the same time on two or more different frequencies, then it's likely a repeater is relaying the transmission. Repeaters in the 450 and 455-MHz bands aren't always 5 MHz apart, as like the rest of the band up to 470 MHz. Also, if you hear the copter or plane on more than one frequency at different times, it's possible that the air unit is transmitting on the private frequency for each radio station it serves. The trick is to find all the frequencies the copter or plane is using and to scan each if traffic reports are important during your commutes.

## Keep Those Letters Coming!

What are your favorite frequencies? Do you have any scanner-related questions? Do you have any listening tips worth passing along to your fellow readers? How about sending in a photo of your listening post or antenna farm? Write to: Chuck Gysi, N2DUP, Scanning the Globe, Popular Communications, Box 11, Iowa City, Iowa 52244-0011, fax to 516-681-2926, or e-mail to <SCAN911@aol.com>. Make sure you indicate in your e-mail that you are writing regarding this column. ■

# The Ham Column

BY KIRK KLEINSCHMIDT, NTØZ

GETTING STARTED AS A RADIO AMATEUR

## An Amateur's Code for the Next Century

**M**utual respect and good operating techniques are (or should be) the goals of every new operator. Unfortunately, we sometimes forget our manners. Taking a fresh look at Amateur Radio's "Golden Rules" and what they mean today — so close ham radio's second century — is a valuable reminder for everyone, and an important lesson for new hams.

The following Amateur's Code has been updated to reflect changing cultural values, but it's still essentially the same Code that's served us well for all these years. (The Amateur's Code was written by Paul M. Segal, W9EEA, of Denver, Colorado. It first appeared in February 1927 *QST*.)

*"The radio operator is considerate . . . never knowingly operates in such a way as to lessen the pleasure of others."*

☞ Do I make a real effort to learn if a particular frequency is in use before calling CQ or another station?

☞ If politely asked to move off a frequency, do I try to accommodate the other operator, or do I make a speech about no one owning a particular frequency or my having been there first?

☞ Do I tie up the local repeater with lengthy ragchewing and prevent others from using the system, or do I switch to a simplex frequency whenever possible?

☞ If asked to QSL, do I prepare and mail the card promptly?

☞ Do I make a sincere effort to eliminate or minimize RFI problems, even if the problem isn't the fault of my amateur equipment?

☞ Do I try to minimize the confusion of a DX pileup by following the DX station's calling instructions, or do I become unnecessarily impatient and operate by the rule of the jungle?



*This operator, name and callsign unknown, works the business end of the club station of Cuba's Federation of Radioaficionados. The photo was submitted by veteran SWLer and longtime Pop'Comm reader Fabien Serve of Valognes, France, who traveled to Cuba last August.*

*"The radio amateur is loyal . . . offers loyalty, encouragement and support to his fellow radio amateurs, local clubs and the American Radio League, through which Amateur Radio in the United States is represented nationally and internationally."*

☞ Do I recognize the fact that my on-air activities will be monitored worldwide and make sure listeners and officials in other countries will be impressed by and respect the amateur radio service?

*"The radio amateur is progressive . . . with knowledge abreast of science, well-built and efficient station and operation above reproach."*

☞ Do I run my rig "barefoot," especially on crowded bands, or do I automatically turn on the amplifier when I turn on the lights in the shack?

☞ Have I purchased the service manual for my rig and familiarized myself with its design and circuitry?

☞ During the past year, did I construct a new piece of equipment or design and hang up a new antenna?

☞ If asked to handle a piece of traffic, would I feel confident to take it, or would I beg off because I "don't do traffic?"

*"The radio amateur is friendly . . . slow and patient operating when requested; friendly advice and counsel to the beginner; kindly assistance, cooperation and consideration for the interests of others; these are hallmarks of the amateur spirit."*

☞ Do I drop into the Novice subbands and work newcomers, making them feel they're a part of our hobby?

# How I Got Started

## Congratulations to David A. Hunt of North Carolina!



Reader David A. Hunt relaxes to the sounds of shortwave at his monitoring post in Trinity, NC.

**P**opular Communications invites you to submit in about 150 words how you got started in the communications hobby. Entries should be typewritten, or otherwise easily readable. If possible, your photo (no Polaroids, please) should be included.

Each month we'll select one entry and publish it here. Submit your entry only once; we'll keep it on file. All submissions become the property of *Popular Communications*, and none will be acknowledged or returned. Entries will be selected taking into consideration the story they relate, and if it is especially interesting, unusual or even humorous. We reserve the right to edit all submitted material for length and grammar, and to improve style.

The person whose entry is selected will receive a one-year gift subscription (or one-year subscription extension) to *Popular Communications*. Address all entries to: How I Got Started, Popular Communications, 76 North Broadway,

Hicksville, NY 11801-2909 or e-mail your entry to <popularcom@aol.com>, letting us know if you're sending photos.

### Our March Winner

From the Tar Heel State, David writes: "I can thank Rush Limbaugh for getting me started in shortwave listening. A while back, the local AM station which airs his show was having trouble with its satellite reception of syndicated programs. Annoyed with the constant interruptions, I bought a shortwave radio after hearing Mr. Limbaugh say that his show is heard worldwide on shortwave.

I quickly became a fan of many international broadcasts and pirate stations. The shortwave spectrum offers many alternatives to the generic-format local stations. By the way, the AM station that I mentioned eventually found the source of their satellite problems after several months - a defective microwave oven in a restaurant one block from the studios!" ■

### Ham Column (from page 37)

☞ When I hear an operator violate a regulation or use bad operating procedure, do I try to point out the problem to him in private, or do I launch a broadside over the air?

☞ Do I constructively encourage Novices and Technicians to upgrade, stressing the additional benefits they'll enjoy, or do I embarrass them with rude comments about their inability to pass the Morse code or written exams?

☞ Do I strictly avoid racist, ethnic and sexist jokes, refusing to be drawn into QSOs that would be offensive to members of any minority group?

☞ When I hear stations with unfamiliar call signs on the local repeater, do I respond, or do I ignore them because they aren't members of my clique?

☞ Have I ever complimented an operator because he or she used good operating techniques?

*"The radio amateur is balanced . . . radio is an avocation, never interfering with duties owed to family, job, school or community."*

☞ Is my day divided into work, sleep and amateur radio, or do I allow time for other important activities with friends and family members?

☞ Do I have friends who aren't hams or belong to groups that aren't amateur radio oriented?

☞ When was the last time I planned a family vacation or outing not centered on a hamfest or radio activity?

*"The radio amateur is patriotic . . . station and skill always ready for service to country and community."*

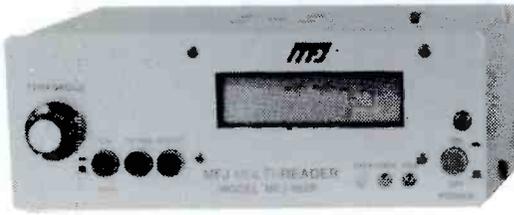
☞ Have I ever volunteered to help out in community events that benefit charitable or service organizations?

☞ Have I ever written to the FCC to voice my opinion about a Notice of Proposed Rule Making, or do I just grumble and complain to others?

With a little effort, we can all play a part in returning amateur radio to a state where good operating techniques and the desire to be respected are the Golden Rule. So do your part to follow the Amateur's Code. Amateur radio can always use a few more role models! ■

# Tap into secret Shortwave Signals

Turn mysterious signals into exciting text messages with this new MFJ MultiReader™



MFJ-462B **Plug this self-contained MFJ MultiReader™ into your shortwave receiver's earphone jack.**  
\$169<sup>95</sup>

Then watch mysterious chirps, whistles and buzzing sounds of RTTY, ASCII, CW and AMTOR(FEC) turn into exciting text messages as they scroll across your easy-to-read LCD display.

You'll read interesting commercial, military, diplomatic, weather, aeronautical, maritime and amateur traffic... traffic your friends can't read -- unless they have a decoder.

## Eavesdrop on the World

Eavesdrop on the world's press agencies transmitting *unedited* late breaking news in English -- China News in Taiwan, Tanjung Press in Serbia, Iraqi News in Iraq -- all on RTTY.

## Super Active Antenna

"World Radio TV Handbook" says MFJ-1024 is a "first rate easy-to-operate active antenna... quiet... excellent dynamic range... good gain... low noise... broad frequency coverage."

Mount it outdoors away from electrical noise for maximum signal, minimum noise. Covers 50 KHz to 30 MHz.

Receives strong, clear signals from all over the world. 20dB attenuator, gain control, ON LED. Switch two receivers and aux. or active antenna. 6x3x5 in. remote has 5' inch whip, 50 ft. coax. 3x2x4 in. 12 VDC or 110 VAC with MFJ-1024 MFJ-1312, \$12.95.

\$129<sup>95</sup> **Indoor Active Antenna**

MFJ-1020B \$79<sup>95</sup>

Rival outside long wires with this *tuned* indoor active antenna. "World Radio TV Handbook" says MFJ-1020 is a "fine value... fair price... best offering to date... performs very well indeed."

Tuned circuitry minimizes intermod, improves selectivity, reduces noise outside tuned band. Use as preselector with external antenna. Covers 0.3-30 MHz. Has Tune, Band, Gain, On/Off/Bypass Controls. Detachable telescoping whip. 5x2x6 in. Use 9 volt battery, 9-18 VDC or 110 VAC with MFJ-1312, \$12.95.

## Compact Active Antenna

MFJ-1022 \$39<sup>95</sup>

Plug this new compact MFJ all band active antenna into your general coverage receiver and you'll hear strong clear signals from all over the world from 300 KHz to 200 MHz -- including low, medium, shortwave and VHF bands.

Also improves scanner radio reception on VHF high and low bands.

Detachable 20 in. telescoping antenna. 9 volt battery or 110 VAC with MFJ-1312B, \$12.95. 3/8x1 1/4x4 in.

Copy RTTY weather stations from Antarctica, Mali, Congo and many others. Listen to military RTTY passing traffic from Panama, Cyprus, Peru, Capetown, London and others. Listen to hams, diplomatic, research, commercial and maritime RTTY.

Listen to maritime users, diplomats and amateurs send and receive error free messages using various forms of TOR (Telex-Over-Radio).

Monitor Morse code from hams, military, commercial, aeronautical, diplomatic, maritime -- from all over the world -- Australia, Russia, Hong Kong, Japan, Egypt, Norway, Israel, Africa.

## Printer Monitors 24 Hours a Day

MFJ's exclusive *TelePrinterPort™* lets you monitor any station 24 hours a day by printing their transmissions on your Epson compatible printer.

Printer cable, MFJ-5412, \$9.95.

## MFJ MessageSaver™

You can save several pages of text in 8K of memory for re-reading or later review.

## High Performance Modem

MFJ's high performance *phaselock loop* modem consistently gives you solid copy -- even with weak signals buried in noise. New threshold control minimizes noise interference -- greatly

## MFJ Antenna Matcher

MFJ-959B \$99<sup>95</sup>

Matches your antenna to your receiver so you get maximum signal and minimum loss.

Preamp with gain control boosts weak stations 10 times. 20 dB attenuator prevents overload. Pushbuttons let you select 2 antennas and 2 receivers. Cover 1.6-30 MHz. 9x2x6 inches. Use 9-18 VDC or 110 VAC with MFJ-1312, \$12.95.

## High-Gain Preselector

MFJ-1045C \$69<sup>95</sup>

High-gain, high-Q receiver preselector covers 1.8-54 MHz. Boost weak signals 10 times with low noise dual gate MOSFET. Reject out-of-band signals and images with high-Q tuned circuits. Pushbuttons let you select 2 antennas and 2 receivers. Dual coax and phono connectors. Use 9-18VDC or 110 VAC with MFJ-1312, \$12.95.

## Dual Tunable Audio Filter

MFJ-752C \$99<sup>95</sup>

Two separately tunable filters let you peak desired signals and notch out interference at the same time. You can peak, notch, low or high pass signals to eliminate heterodynes and interference. Plugs between radio and speaker or phones. 10x2x6 in.

## Easy Up Antennas Book

How to build MFJ-38 and put up inexpensive, fully tested wire antennas using readily available parts that'll bring signals in like you've never heard before.

Covers receiving antennas from 100 KHz to almost 1000 KHz. Includes antennas for long, medium and shortwave, utility, marine and VHF/UHF services.

## Receive Color News Photos, Weather Maps, RTTY, ASCII, Morse Code

MFJ-1214PC \$149<sup>95</sup>

Use your computer and radio to receive and display brilliant full color FAX news photos and incredible WeFAX weather maps with all 16 gray levels. Also RTTY, ASCII and Morse code.

Animate weather maps. Display 10 global pictures simultaneously. Zoom any part of picture or map. Frequency manager lists over 900 FAX stations. Automatic picture capture and save.

Includes interface, easy-to-use menu driven software, cables, power supply, comprehensive manual and Jump-Start™ guide. Requires 286 or better computer with VGA monitor.

## Super Hi-Q Loop™ Antenna

The Super Hi-Q MFJ-1782 Loop™ is a professional quality remotely tuned 10-30 MHz high-Q antenna. It's very quiet and has a very narrow bandwidth that reduces receiver overloading and out-of-band interference.

## High-Q Passive Preselector

MFJ-956 \$39<sup>95</sup>

The MFJ-956 is a high-Q passive LC preselector that lets you boost your favorite stations while rejecting images, intermod and other phantom signals. Covers 1.5-30 MHz. Has preselector bypass and receiver grounded pos. 2x3x4"

## Mobile Scanner Ant.

Cellular MFJ-1824BB/BM look-a-like. Covers 25-1300 MHz. Highest gain on 406-512 and 108-174 MHz, 19 in. Magnet mount. MFJ-1824BB has BNC/UHF plug; MFJ-1824BM has Motorola plug.

improves copy on CW and other modes.

## Easy to use, tune and read

It's easy to use -- just push a button to select modes and features from a menu.

It's easy to tune -- a precision tuning indicator makes tuning your receiver easy for best copy.

It's easy to read -- the 2 line 16 character LCD display with contrast adjustment is mounted on a sloped front panel for easy reading.

Copies most standard shifts and speeds. Has MFJ AutoTrak™ Morse code speed tracking.

Use 12 VDC or use 110 VAC with MFJ-1312B AC adapter, \$12.95. 5/8x2 1/2x5 1/4 inches.

## No Matter What Guarantee

You get MFJ's famous one year *No Matter What™* unconditional guarantee. That means we will repair or replace your MFJ MultiReader™ (at our option) *no matter what* for a full year.

## Try it for 30 Days

Order an MFJ-462B MultiReader™ from MFJ and try it in your own setup -- compare it to any other product on the market regardless of price.

Then if you're not completely satisfied, simply return it within 30 days for a prompt and courteous refund (less shipping).

Order today and try it -- you'll be glad you did.

## MFJ 12/24 Hour LCD Clocks

MFJ-107B \$9<sup>95</sup>

MFJ-108B \$19<sup>95</sup>

MFJ-105B \$19<sup>95</sup>

MFJ-108B, dual clock displays 24 UTC and 12 hour local time simultaneously. MFJ-107B, single clock shows you 24 hour UTC time. 3 star rated by *Passport to World Band Radio!*

MFJ-105B, accurate 24 hour UTC quartz wall clock with large 10 inch face.

## MFJ Antenna Switches

MFJ-1704 \$59<sup>95</sup>

MFJ-1702B \$21<sup>95</sup>

MFJ-1704 heavy duty antenna switch lets you select 4 antennas or ground them for static and lightning protection. Unused antennas automatically grounded. Replaceable lightning surge protection device. Good to 500 MHz. 60 dB isolation at 30 MHz.

## World Band Radio Kit

MFJ-8100K \$59<sup>95</sup> kit

MFJ-8100W \$79<sup>95</sup> wired

Build this regenerative shortwave receiver kit and listen to shortwave signals from all over the world with just a 10 foot wire antenna.

Has RF stage, vernier reduction drive, smooth regeneration, five bands.

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# Pop'Comm's World Band Tuning Tips

March 1998

This listing is designed to help you hear more shortwave broadcasting stations. The list includes a variety of stations including international broadcasters beaming programs to North America, others to other parts of the world, as well as local and regional shortwave stations. Many of the transmissions listed here are not in English. Your ability to receive these stations will depend on time of day, time of year, your geographic location, highly variable propagation conditions and the receiving equipment used.

AA, FF, SS, GG, etc. are abbreviations for languages (Arabic, French, Spanish, German). Times given are in UTC, which is five hours ahead of EST, i.e. 0000 UT equals 7 p.m. EST, 6 p.m. CST, 4 p.m. PST.

UTC	Freq.	Station/Country	Notes	UTC	Freq.	Station/Country	Notes
0000	4955	"Radio Nacional, Colombia"	SS	0200	6120	Croatian Radio	
0000	5970	"BBC, via Ascension Island"		0200	6155	Radio Romania Int'l	
0000	6055	"Radio Exterior de Espana, Spain"		0200	7746	"Radio Cristal, Peru"	SS
0000	7495	Kol Israel	HH	0200	9737	"Radio Nacional, Paraguay"	SS
0000	9580	"Radio Yugoslavia, Bosnia-Hercegovina"		0200	11710	"RAE, Argentina"	
0000	9745	"HCJB, Ecuador"		0200	13685	"China Radio Int'l, via French Guiana"	SS
0000	11750	"BBC, via Ascension Island"		0230	4832	"Radio Reloj, Costa Rica"	SS
0000	11760	"Radio Havana, Cuba"	SS	0230	7450	Voice of Greece	Greek
0000	11780	"Radio Nacional Amazonia, Brasilia, Brazil"	PP	0230	9545	"Deutsche Welle, Germany"	GG
0000	11915	"Radio Gaucha, Porto Alegre, Brazil"	PP	0230	9870	Radio Austria Int'l	
0029	7260	V. of Islamic Republic of Iran		0230	11910	"Radio Budapest, Hungary"	
0030	5905	"Radio Budapest, Hungary"		0230	7545	Radio Norway Int'l	NN/EE
0030	6185	"Radio Netherlands, via Bonaire"		0250	7200	Republic of Sudan Radio	"AA, s/on"
0030	11815	"Radio Brazil Central, Goiania, Brazil"	PP	0250	9605	Vatican Radio	
0050	6010	"RAI, Italy"		0257	4820	Radio Botswana	s/on
0100	3375	"Radio Clube, Dourados, Brazil"	local	0300	2360	"Radio Maya, Guatemala"	local
0100	4201	"Radio Nacional, Bolivia"	SS	0300	4770	"Centinela del Sur, Ecuador"	SS
0100	4755	"Radio Educacao Rural, Brazil"	PP	0300	4790	"Radio Atlantida, Iquitos, Peru"	SS
0100	4985	"Radio Brazil Central, Goiania, Brazil"	PP	0300	4935	Voice of Kenya	
0100	5025	"Radio Rebelde, Cuba"	SS	0300	6550	Voice of Lebanon	AA
0100	5060	"Radio Nac. Progreso, Loja, Ecuador"	SS	0300	6980	"RFPI, Costa Rica"	USB
0100	5910	"Radio New Nigeria, via Germany"	EE/local	0300	7135	"Radio France Int'l, via South Africa"	FF
0100	5930	Radio Slovakia Int'l		0300	9550	Radio Ukraine Int'l	
0100	5960	"Radio Japan, via Canada"		0300	9690	"China Radio Int'l, via Spain"	
0100	6135	Swiss Radio Int'l		0300	9705	Radio Mexico Int'l	SS/EE
0100	7300	Radio Slovakia Int'l		0300	11785	Radio Iraq Int'l	AA
0100	9585	"Radio Globo, Brazil"	PP	0330	4800	Radio Lesotho	local
0100	9820	"Radio Havana, Cuba"		0330	4919	"Radio Quito, Ecuador"	SS
0130	7250	All India Radio	local	0330	5030	"Adventist World Radio, Costa Rica"	SS
0145	7160	"Radio Tirana, Albania"		0330	7115	Radio Sweden	
0200	4795	"Rdf. Aquidauana, Aquidauana, Brazil"	PP	0330	9570	Radiodif. Portugal Int'l	
0200	4819	"La Voz Evangelica, Tegucigalpa, Honduras"	SS	0330	9800	"Radio France Int'l, via Fr. Guiana"	FF
0200	4830	"Radio Tachira, San Cristobal, Venezuela"	SS	0400	3300	"Radio Cultural, Guatemala"	EE/SS
0200	4835	"Radio Tezulutlan, Guatemala"	SS/local	0400	4775	"Trans World Radio, Swaziland"	GG
0200	4915	"Radio Internacional, San Pedro Sula, Honduras"	SS	0400	4800	"XERTA, Mexico"	SS
0200	5045	"Radio Cultura do Para, Belem, Brazil"	PP	0400	4850	Cameroon Radio TV	FF
0200	5950	"Voice of Free China, via Florida"		0400	5077	"Caracol, Colombia"	SS
0200	6000	"Radio Havana, Cuba"		0400	7110	Radio Ethiopia	local
				0430	4904.5	"Radiodifusion Nationale Chadienne, Chad"	FF
				0500	4870	Radiodifusion Benin	FF
				0500	7255	Voice of Nigeria	

UTC	Freq.	Station/Country	Notes	UTC	Freq.	Station/Country	Notes
0500	7475	"RT Tunisienne, Tunisia"	AA	1300	9710	"Radio Vilnius, Lithuania"	s/on
<b>0530</b>	4815	"Radio Burkina, Burkina-Fasso"	FF	1300	9840	Voice of Vietnam	
<b>0600</b>	3270	Namibian Broadcasting Corp.	local	1300	11815	Polish Radio	
0600	3450	"Radio Veritas, Liberia"	EE/local	1300	11855	Radio Canada Int'l	
0600	4783	"RTV Malienne, Mali"	FF	1300	13580	"Radio Prague, Czech Republic"	
0600	4915	Ghana Broadcasting Corp.	EE	1300	13635	Swiss Radio Int'l	
0600	5047	"Radio Lome, Togo"	FF	1300	15060	Broad. Svc of Kingdom of Saudi Arabia	AA
0600	6015	"Austria Radio Int'l, via Canada"		1300	17610	Voice of Russia	
<b>0630</b>	5840	Swiss Radio Int'l		1300	17745	Radio Romania Int'l	
<b>0645</b>	5883	Vatican Radio	AA	1330	9680	"Radio Veritas Asia, Philippines"	various
<b>0700</b>	3290	Voice of Guyana		1330	13710	All India Radio	
0700	5895	Croatian Radio	Croatian	1330	15290	Voice of Turkey	TT
0700	6115	"Radio Union, Peru"	SS	1330	15295	"Radio Tashkent, Uzbekistan"	
0700	7150	Radio Ukraine Int'l	Ukrainian	1330	15395	"UAE Radio, Dubai"	
0700	7345	"Radio Prague, Czech Republic"		<b>1400</b>	9530	Radio Thailand	
<b>0730</b>	6030	"Radio Marti, USA"	SS	1400	12080	Kol Israel	
<b>0800</b>	9365	"HCJB, Ecuador"		<b>1430</b>	11675	"Radio Rossi, Russia"	RR
0800	9885	"Swiss Radio Int'l, via French Guiana"	II	1430	17675	"Channel Africa, South Africa"	
<b>0900</b>	4885	"Radio Clube do Para, Brazil"	PP	<b>1530</b>	11780	Broad. Svc of Kingdom of Saudi Arabia	AA
0900	5980	"Radio Guarja, Brazil"	PP	1530	11785	Voice of the Islamic Republic of Iran	
0900	6020	"Radio Gaucha, Porto Alegre, Brazil"	PP	1530	15435	"Radio Jamahiriya, Libya"	AA
0900	6035	"Radio Vlaanderen Int'l, Belgium"		1530	15650	Kol Israel	
0900	6100	Radio New Zealand Int'l		<b>1600</b>	11690	Radio Jordan	
<b>0930</b>	3329	"Ondas del Huallaga, Huanuco, Peru"	SS	1600	15160	"Radio Algiers Int'l, Algeria"	
0930	9515	"KNLS, Alaska"		1600	15460	Radio France Int'l	
0930	9770	Radio Australia		<b>1630</b>	13675	"UAE Radio, Dubai"	
<b>1000</b>	3280	"La Voz del Napo, Ecuador"	SS	1630	13730	Radio Austria Int'l	
1000	4824	"La Voz de la Selva, Iquitos, Peru"	SS	<b>1700</b>	11570	Radio Pakistan	local
1000	4980	"Ecos del Torbes, Venezuela"	SS	1700	11800	"Channel Africa, South Africa"	
1000	6010	"Radio Mil, Mexico"	SS	1700	15084	Voice of the Islamic Republic of Iran	Farsi
1000	9355	"KHBI, Saipan"		1700	15240	"Channel Africa, South Africa"	
<b>1100</b>	3220	"Radio Morobe, Papua New Guinea"	Pidgin	1700	21655	Radio Portugal Int'l	PP
1100	3925	"Radio Tampa, Japan"	JJ	<b>1745</b>	13780	All India Radio	
1100	4750	"Xizang PBS, Tibet, China"	CC	<b>1800</b>	11645	Voice of Greece	GG
1100	4800	"Radio Cultural Coatan, Guatemala"	SS/local	1800	11990	Radio Kuwait	
1100	4915	"Armonias del Caqueta, Colombia"	SS	1800	13590	Radio Ukraine Int'l	Ukrainian
1100	5020	"Radio Horizonte, Chachapoyas, Peru"	SS	<b>1830</b>	11620	All India Radio	
1100	7285	Radio Thailand		<b>1930</b>	9022	Voice of Islamic Republic of Iran	
1100	9930	"KWHR, Hawaii"		<b>2005</b>	13610	"Radio Damascus, Syria"	
1100	15550	Radio Pakistan		<b>2030</b>	6220	"VORGAN, Angola"	PP
<b>1130</b>	9650	"Radio Korea Int'l, via Canada"		<b>2100</b>	9735	Radio Oman	AA
1130	11650	Radio Sweden		2100	12015	"HCJB, Ecuador"	
1130	11715	"Radio Korea Int'l, via Canada"		<b>2130</b>	7170	Radio of the United Arab Emirates	AA
1130	15240	Radio Sweden		2130	9965	Voice of Armenia	
<b>1200</b>	4725	Voice of Myanmar (Burma)	local	<b>2200</b>	9655	Voice of Turkey	
1200	4753	"Radio Republik Indonesia, Ujung Padang"		2200	11787	Republic of Iraq Radio	AA
			II	<b>2230</b>	6050	"Federal Radio Corp., Nigeria"	
1200	6130	"Lao National Radio, Laos"	Laotian	2230	6160	Vatican Radio	
1200	9414	Radio Australia		2230	9870	Broad. Svc of Kingdom of Saudi Arabia	AA
1200	9505	"Radio Veritas Asia, Philippines"	various	2300	4865	"Radio Alvorada, Londrina, Brazil"	PP
1200	9725	Voice of Russia		2300	5960	Radio Canada Int'l	
1200	9750	Voice of Malaysia	"Malay, other"	2300	6040	"Radio Clube Paranaense, Brazil"	PP
1200	11815	Radio Japan		2300	6090	"Caribbean Beacon, Anguilla"	
1200	11885	Radio Romania Int'l		2300	6100	"Radio Yugoslavia, Bosnia-Hercegovina"	
1200	13795	"Radio Vlaanderen Int'l, Belgium, via Uzbekistan"	Dutch	2300	6933	China Radio Int'l	
				2300	7125	Voice of Russia	
1200	13805	Radio Norway Int'l		2300	7530	Radio Bulgaria	
1200	15215	"BBC, via Antigua"		2300	9515	Radio Romania Int'l	
1200	15445	"Radiobras, Brazil"		2300	9755	Radio Canada Int'l	
<b>1230</b>	15400	YLE Radio Finland		2300	9900	"Radio Cairo, Egypt"	
<b>1300</b>	6105	Radio New Zealand Int'l		2300	11700	"Radio Pyongyang, North Korea"	
1300	7385	China Radio Int'l					

# Product Parade

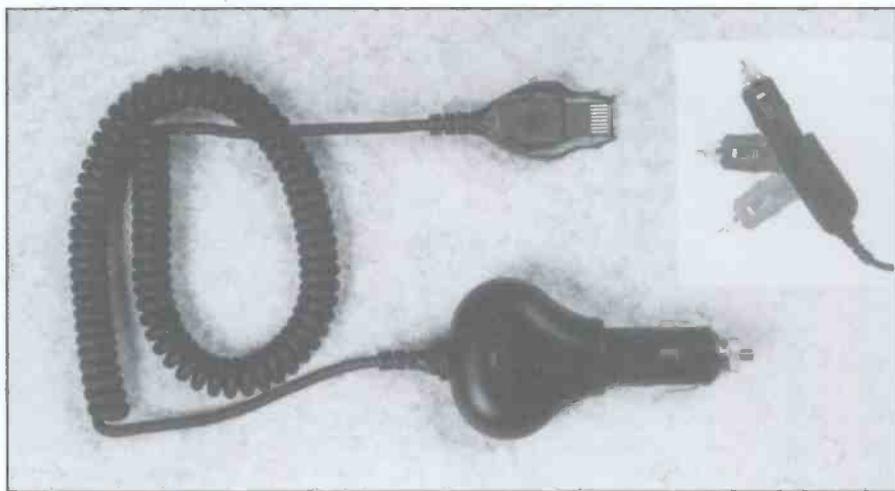
BY NANCY BARRY  
AND R.L. SLATTERY

REVIEW OF NEW, INTERESTING AND USEFUL PRODUCTS

## New Generation Power Cord for Portable Cell Phones

ORA Electronics, Inc. has announced the introduction of a new generation vehicle cigarette lighter adapter, more commonly known as a power cord, for portable cellular telephones.

The new generation power cord features improved electronic circuitry to enable a faster, safer, controlled battery charge. This new circuitry features a two-step charging system. Step one rapidly charges the battery to about 75% of its capacity. Step two switches to a slower charging mode to prevent battery pack damage and ensure peak battery performance. A two-color LED allows the user to monitor the status of the unit.



A unique ratchet mechanism allows the plug of the power cord to "tilt," enabling use in a variety of vehicles where access to the cigarette lighter

receptacle is restricted. This "tilt" design also helps reduce stress on the cord, preventing premature wear.

For more information, contact ORA

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### CAT-5000

Only \$99.95 + S & H

#### SPECTRUM ANALYSIS ON YOUR PC

- With the addition of AOR's SDU-5000 Spectrum Analyzer and this **NEW Windows Software** any radio that has a 10.7MHz IF output will give you full computer controllable spectrum analysis.
- Plus, with the listed radios below, you can have a complete computerized control of receive frequency, direct frequency readout, and a spectrum bandwidth (variable from 500KHz to 10 MHz).
- Just use your mouse to "arm chair" the controls. Never touch the radio once the software is running.



- AR3000A (Requires Installation of IF output).
- AR5000
- R7000 ICOM
- R7100 ICOM
- R9000 ICOM
- R8500 ICOM
- Most ICOMs that support user programmable addresses. (Must have 10.7MHz IF Output)

#### Features \*Indicates for above listed radios only.

- Variable bandwidth, up to 10.7 MHz.\*
- Variable Peak Readout.
- Instant Readout of Frequency any place on the PC's Display.
- Automatic Scanning of programmable ranges (up to 100 available).\*
- Instant change of center frequency with a simple mouse click. \*
- Selectable Audio Alert of frequency signal peaks.
- Recording of Incoming Spectrum data to disk.
- Direct (Variable) Threshold readout of all peaks on display.
- Playback of Recorded Spectrum data from disk, even without connecting the Radio/SDU!!
- Signal Averaging, PLUS our exclusive "VARI-COLOR" Analysis.
- THREE different graphical analysis modes for detailed analysis.

#### Minimum Requirements

- IBM Compatible PC with 8 meg ram.
- Windows 3.1 or later.
- 8 meg Hard Drive space.
- AOR SDU-5000 and a radio with 10.7 MHz "IF" output.

### CAT-WHISKER

#### TIRED OF YOUR HANDHELD SCANNER ALWAYS FALLING OVER JUST TO KEEP THE ANTENNA "VERTICAL"?

- Try our unique, swivel base, telescopic scanner antenna. Our new CAT-WHISKER lets you lay your handheld scanner on its back and still keep the antenna vertical!
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  - Easily adjusts to any length AND frequency.
  - Fits ANY scanner with a BNC antenna connector.
  - Fits on BACK or TOP mount scanner antennas inputs.

- CAT-WHISKER #1 (5 to 23 inches) \$19.95
- CAT-WHISKER #2 (6 to 36 inches) \$24.95 (plus \$2.50 S & H)



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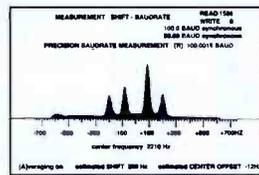
## HOKA CODE-3 USA Version

### "The Standard Against Which All Future Decoders Will Be Compared"

Many radio amateurs and SWLs are puzzled! Just what are all those strange signals you can hear but not identify on the Short Wave Bands? A few of them such as CW, RTTY, Packet and Amtor you'll know - but what about the many other signals?

There are some well known CW/RTTY Decoders but then there is CODE-3. It's up to you to make the choice, but it will be easy once you see CODE-3. CODE-3 has an exclusive auto-classification module that tells YOU what you're listening to AND automatically sets you up to start decoding. No other decoder can do this on ALL the modes listed below - and most more expensive decoders have no means of identifying ANY received signals! Why spend more money for other decoders with FEWER features? CODE-3 works on any IBM-compatible computer with MS-DOS with at least 640kb of RAM, and a CGA monitor. CODE-3 includes software, a complete audio to digital FSK converter with built-in 115V ac power supply, and a RS-232 cable, ready to use. CODE-3 is the most sophisticated decoder available for ANY amount of money.

- 26 Modes Included in STANDARD package include:
- Morse \*
  - RTTY/Baudot/Murray \*
  - Sitor CCIR 625/476-4
  - ARQ - Navtex \*
  - AX25 Packet \*
  - Facsimile all RPM (up to 16 gray shades at 1024 x 768 pixels)
  - Autospec - Mk's I and II
  - DUP-ARQ Artrac
  - Twinplex
  - ASCII \*
  - ARQ6-90/98
  - SI-ARQ/ARQ-S
  - SWED-ARQ-ARQ-SWE
  - ARQ-E/ARQ1000 Duplex
  - ARQ-N-ARQ1000 Duplex Variant
  - ARQ-E3-CCIR519 Variant
  - POL-ARQ 100 Baud Duplex ARQ
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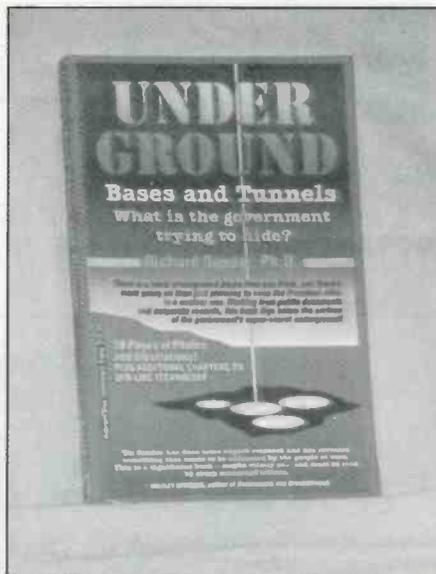
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Richard Sauder, Ph.D., working from official government records and corporate documents, has put together quite a fascinating 142-page illustrated book, *Underground Bases and Tunnels: What is The Government Trying to Hide?*

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ing and underground bases, abductions, needles, and implants. He explains why the secret bases are there, complete with footnotes and full documentation. There's an amazing 50-page section showing photos, maps, and blueprints.

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tion for everyone interested in contemporary science, the military, politics, industry, engineering, and weird secret stuff. *Underground Bases and Tunnels* is \$15.95, plus \$5 shipping and handling (\$7 to Canada) from CRB Research Books, Inc., P.O. Box 56, Commack, NY 11725-0056. MC/VISA welcomed. Phone orders, call 516-543-9169; e-mail credit card orders <crbbooks@aol.com>.

## The Scanner Club

*The Scanner Club* newsletter is an extremely useful and well done bi-monthly publication that recently arrived upon the scene. Covering all aspects of the hobby, and all U.S. geographic areas, TSC is edited by Les Mattson. A recent issue ran to 66 pages, and was jam-packed with frequencies. A year's subscription (six issues) is \$24.95 within the continental U.S. Make checks payable to Les Mattson, and send to The Scanner Club, P.O. Box 62, Gibbstown, NJ 08027. If you need more information, the phone is 609-423-1603, and the e-mail address is <lesscan@aol.com>.

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# The Old CB Shack

BY DON PATRICK

GIVING LIFE TO YESTERDAY'S RELICS

## Tuning Up the Messenger I, II and 223

In the January issue, we started looking into three of the most popular CB units of the 1960's and the early '70s, the E.F. Johnson Messenger I, II and 223. While two of them (I and II) would work on AC or DC, very few were used mobile due to their size and weight. Interestingly enough, both the Messenger I and II were not only available in 117 volt AC and 6 volt DC, they were also available in 117 volt and 24 volt DC or 117 volt, 230 volt AC and 12 volt DC. You can tell which combination you had by the model number. If you are not sure which you have, write and give me the model number and I will let you know what voltages it will work with as wired. However, since Johnson used a universal power transformer, you can re-wire it to operate on whatever voltage you need.

Last issue we covered the differences between the units and the strong or weak points of each model. We will assume you have your unit in basic working condition at this time with any bad parts replaced. If you need a microphone for it, any ceramic type such as the old Turner 350C with a 4-wire cord connected for relay switching will work fine. A microphone from a modern transistorized unit will be a magnetic type (low impedance) and will NOT work. Putting a power microphone on the unit might be the easiest way to go and you can use any number of brands. Some that we noted which will work fine are made by Astatic. If you want a hand microphone, try a D104-M6B or a D-575M6. For a stand microphone, look for an Astatic D104-NE or TUP-9.

We will start the tune-up procedures with the Messenger I, followed by the Messenger II and the 223. Since they are similar units, all we have to do for the II is add the tuning for the 2nd IF stage. The instructions are for the lower 23 channels. If you are going to use primarily the upper 17, then just keep in mind that when we refer to channel 1 or channel 23, that we are saying the *lowest and highest* channels you will be using and channel 11 means the middle channel of the 5 or 10 channels you will have in the Messenger I or II.

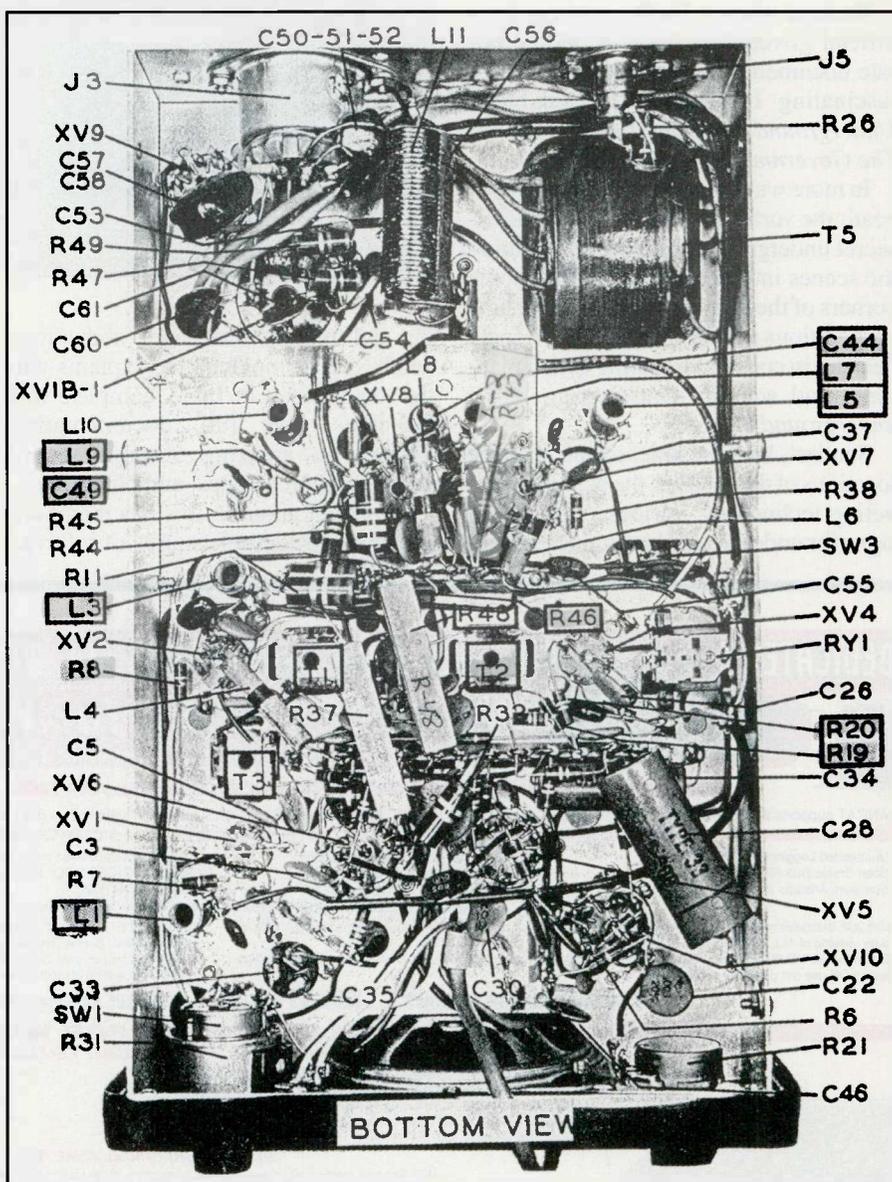


Figure 1. Messenger I.

All three models (I, II and 223) use "stagger tuning" in the receiver front end for good performance across the entire 23 channels. If you are using some of the upper 17 channels, this becomes even more important. Back in the 1960s, technology did not include broad band front ends as we have today and if you "peak tune" these units, they will be great on

that channel plus or minus about five channels above and below. However, channels more than five away will really be poor and the further away from the one you tune on, the poorer the performance. If you are going to only use one channel, then peak tune it on that channel and forget about stagger tuning.

We will assume that sometime in the

**“... there are numerous exposed points with more than enough voltage present to harm you and even be lethal!”**

past the unit was tuned with an incorrect crystal installed or other problem, so we'll do a full alignment. Many people think that if a crystal is the same size, it's OK to use. This is not correct. The Messenger I and II use a series resonant crystal and a parallel resonant type looks just like it but will be off frequency. If you don't know what you have in your unit, check them. Just because it says channel 11 on it, does not mean it is a channel 11 crystal for your unit. Even if it works, it may be off frequency and if you tune on it, your other channels, which have correct crystals installed, would offer reduced performance.

You will need a frequency meter, a signal generator, a DC volt meter (at least 50K/volt or better) and an AC volt meter, plus the proper tuning tools to fit the cores to tune these units. For the Messenger 223, you will also need an RF volt meter or probe.

Turn the unit on and allow it to warm up and stabilize for about 5 minutes. Keep in mind while working with these units that there are numerous exposed points with more than enough voltage present to harm you and even be lethal! If you don't know what you are doing, take it to someone who does.

**NOTE:** Due to space limitations, we can not repeat all of the figures each month. Therefore, they are numbered consecutively and you may well need to refer to one in the January issue this month or in May you may need a figure from January and March and May. So save all three issues to have a full set.

### Tuning the Receiver

Connect the signal generator through a .01mFd blocking capacitor, 600 volt to pin 1 of tube XV2, (Figure 1), the 12BE6 with shield to chassis. Tube bases are counted from the gap looking at the bottom (or pin side) clockwise. So pin #1 is the first pin to the left of the gap and has a 22K resistor (R-8) and a 330 pF capacitor connected to it. Set the generator to 455 kHz with 30 percent modulation at 1000 Hz. Connect the AC meter (adjusted to a low scale) across the speaker voice coil. Connect the DC meter (set to 2 to 5 volts DC range) to the AVC line at the junction of R-19 and R-20. This will be a negative voltage with signal, so set your meter to read a negative voltage or connect the black lead to the AVC line and the red meter lead to chassis. Open your squelch control so the unit is making noise and turn the volume control up to about half way. Adjust the signal generator output up until the DC meter on the AVC line reads about 1 volt. During the tuning, as you make improvements, keep turning the signal generator output down so that the reading on the DC meter does not exceed 1.5 volts.

Carefully turn the top core of T-2 until it is flush with the top of the can, then adjust the bottom core, bottom meaning accessible from the bottom side of the chassis, (see Figure 1 and the 'Top View' illustration of the unit on page 62 of the January issue)" for maximum audio output as indicated on the AC meter connected across the voice coil. You may need to change the scale on the AC meter as we go along to keep it from pegging out. Now go back to the top core of T-2 and adjust it for maximum on the AC meter. At all times, keep lowering the signal generator output if needed to keep the DC meter reading less than 1.5 volts. Now

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adjust the top core of T1 flush with the top of the can and then adjust the bottom core of T1 for maximum audio output as indicated by the AC reading meter. Then adjust to top core of T1 for maximum audio output. This finishes the IF alignment on a Messenger I.

You need to adjust the frequency of the receive crystals. You only have one adjustment, L-3, for all your channels, so check all of them and split the difference between the highest and lowest. You will need to set the frequency meter to the actual crystal injection frequency which is 455 kHz below the channel frequency. For channel 12 (27.105), you would set the frequency meter to 26.650 MHz (27.105 minus 455 kHz).

For the RF alignment, leave the AC and DC meters attached as before during the IF segment. Connect the signal generator to the antenna jack adjusted to channel 1 (or your lowest channel) with the modulation set to 30 percent and 1000 Hz. As before, keep the generator level low enough that the reading on the DC meter measuring the AVC voltage does not exceed 1.5 volts. Starting with the top core of T-3 flush with the top of the can, turn it inward until you reach the second peak which will be with the core about

1/2 inch down from the top of the can. Adjust the core for maximum audio as read on the AC meter connected across the speaker. The second peak is stronger than the first peak. Now set the channel selector to your highest channel (near channel 23, hopefully). Adjust the generator to this same channel and tune the bottom core of T-3 (starting with the core almost out of the can) inward for maximum audio output on the AC meter while keeping the DC meter reading less than 1.5 volts. Now set the unit to your middle channel (near channel 11 or 12) and the generator for the same frequency. Tune the core of L1, starting from the core out position for maximum audio. When we have you tune a core from the core out or flush with the outside of the can, this is to prevent tuning to an incorrect spurious signal or the image frequency. Trust me, just do it! This completes the receiver tuning for a Messenger I receiver.

### Tuning the Transmitter

Tuning on the transmitter is all done on your middle channel, near channel 11. Connect a 50-ohm dummy load and watt meter to the antenna connector. Connect the negative DC meter lead to the junction

of R-42 and L-2 (see **Figure 1**) and positive lead to chassis ground. One end of L-2 connects to pin 3 (or pin 6) of V-8. Connect your lead to the end of L-2 away from the tube pin. Key the microphone and adjust L-7 for the maximum reading (typically about a minus 18 volts). Now check the frequency and set it by adjusting L-5. As on the receiver, you only have one control to adjust the frequency for all the channels, so split the difference between the best and worst of them. As long as a channel is within 1300 cps or so, it will be legal and you will not lose any performance compared to one that was exactly on frequency. Now recheck L-7 to see that it's still on peak.

Next, move the DC meter leads to be across R-46 (a 100-ohm resistor) with the red or positive meter lead on the side connected to the junction of R-46 and R-48 and the black or negative lead on the other side of R-46 which is connected to choke L-8. Key the PTT and adjust L-9 for minimum reading on the DC meter. Adjust C-49 for maximum reading on the watt meter. Now, make small changes in both L-9 and C-49 (first one and then the other) for the maximum power out on the watt meter. Each changes the other a small bit, so you'll need to do this a few times, but keep the L-9 setting close to the position giving you a minimum reading on the DC meter. You will find that a position just one side or the other of minimum will give you the best power output.

Check for proper PA neutralization by connecting the DC meter back to the junction of R-42 and L-2 (black lead) and chassis (red lead) as before in step one. Note the reading as L-9 is tuned slightly back and forth. If the DC meter reading increases as L-9 is backed out of the coil, change the setting of C-44 which needs to be less capacity. A setting of C-44 can be found where the DC meter reading only changes slightly as L-9 is turned in or out of it's coil a little. Find this point and leave C-44 set there. Now, go back and adjust L-9 and C-49 for maximum power out on the watt meter. This completes the tuning of the Messenger I.

In the third and final installment, we will cover the minor changes in order to fully align the Messenger II, plus fully tune the Messenger 223.

Keep those questions coming, and if you include an SASE, I do reply within a day or two. I hope to start including some of the most interesting letters soon. Write to Don Patrick, 3701 Old Jenny Lind, Fort Smith, AR 71901.

'til next time, this is the Old-Timer. ■

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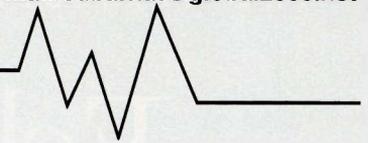
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## Major Changes Coming To CB . . .

Well, it's over. The days of easy CB are ending. We knew they couldn't last, and they haven't. They've been nice, but now they are gone, or at least will be soon. Major changes are coming to CB and like them or not, there isn't a thing we can do, but submit and adjust our expectations and techniques accordingly.

"What the heck," you may ask, "are you talking about, Ed? Is it more legislation? Is it a lack of transistors from Korea? Maybe another aggressive sheriff or increased funding for the FCC?" No, it is bigger than any one of those. It is much bigger than all of them put together.

You can always, for a few million dollars or so, influence Congress or build a semiconductor plant. Even an army of sheriffs and an FCC with its own printing press at U.S. Treasury couldn't begin to match the power and scope of the event that is just beginning to let its presence be known. Nothing on earth can, because the source of this force is not of the world!

Now before you summon an exorcist or contact Scully and Mulder, let me assure you that what we are dealing with here is purely natural and expected. Let me also assure you that the event in question will definitely and dramatically alter the way you use your CB well into the next millennium.

If you are a relative newcomer to CB, say having arrived within the past two or three years, you have come know and enjoy CB during its *local* mode - a time when you can key up the base and chat with neighbors just about anytime night or day. A time when even the most meager mobiles can reach out and connect over several miles whenever they want. A time that will soon end.

### Mother Nature At Her Best and Worst!

Ninety-three million miles away, events are occurring on the sun which confirm that Solar Cycle 23 has begun. After several years of relative inactivity, solar

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*" . . . as the effect of Solar Cycle 23 increases, local communications of more than one or two miles will be increasingly difficult - if not impossible - during daylight hours."*

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storms and sunspots are on the increase. As they grow, huge amounts of energy will be shot into space. As this energy rushes past the earth, some of it will be transferred to and charge sections of our upper atmosphere. When that happens, CB signals that would usually pass quietly out into space, don't. They are instead, reflected by this charged atmosphere, and bounce or "skip" noisily back to earth. The signals then arrive, at or near full strength, hundreds or thousands of miles from their point of origin, overpowering all but the strongest local signals.

Experienced operators, those who have been on CB for five or more years, know that as the effect of Cycle 23 increases, local communications of more than one or two miles will be increasingly difficult - if not impossible - during daylight hours. Fortunately, late night and early mornings will (usually) still offer good local conditions.

Yes, the arrival of Solar Cycle 23 is dire news for local CB. The accompanying increase of long distance skip will generate daytime noise levels that will test the skill, endurance and patience of the most dedicated operator. It will be particularly challenging for those who use and monitor the emergency and assistance networks on channel 9. Even the biggest and baddest of the low and the loud will finally run up against someone - or something - that can be louder longer than they can. When it's over, sometime around 2006, many will have given up and gone off the air.

### Another Person's Treasure!

On the other hand, there are some operators who have been anxiously anticipating the arrival of Solar Cycle 23. It is par-

ticularly good news for SSB operators who participate in the Freeband; that segment of frequencies between CB channel 40 and the 10 meter amateur band. For them, increased skip opens numerous opportunities for long distance (national and international) communications. In the very near future, though illegal, Freeband operation will be better and more exciting than it has been for years!

### Where Do You Go From Here?

As surely as Solar Cycle 23 is underway and as certain as the increased skip and noise levels it brings will drive many of you from your radios, at least some of you will be tempted to experience the intrigue and excitement of the Freeband. If you do, remember . . . it is illegal! Also, remember that while illegal, it has rules. Further, you should learn and then comply with these rules. If you don't, you could find out that poor operators have a tendency to "get caught." If you do learn and follow them, you should soon find yourself enjoying hours of stimulating radio. The following letter is offered in hopes of getting those "who will" off on the right foot.

"Dear Ed,

I am sure you have heard it all when dealing with the good and bad of CB radio. I have been with the hobby since the late '70s beginning with the usual AM'ing local stuff like having some words on 19 to constructive chat with a few "real operators" on another channel away from the good buddy slot.

Then, after a few years, when one of the group got to know me better, he intro-

***"It is particularly good news for SSB operators who participate in the Freeband."***

duced me to Freebanding, letting me know it was illegal but . . .

So, I thought I would try it out and asked a few questions of some people in the hobby. Having been in the CB and SWLing hobby a number of years, I wasn't totally stupid, so I could sort out the 'not so good advice.'

I didn't want to bring too much attention to myself so I started with the basics. The radio of choice was a HR2510, and I took it to a very good radio shop, had the works done specifying that the radio had to be clean even if it didn't transmit at full power. It cost a few bucks, but after hearing some of the comments about how good it sounded for a "2510" it was worth every dollar. I then got the necessary meters and a three-element beam. After all the friends I made and the friendships developed during the last solar cycle, and all the knowledge I gained about radios, antennas, and propagation. I don't regret anything I did back then even if it was illegal.

I did however, hesitate using a frequency down in the 26 MHz band. After a few years on 26.470 with the Charlie Oscar (Canadian Outlaws) group, I was monitoring one day in the mobile and heard some conversation off frequency. It didn't sound like a typical QSO in the band and quickly got my attention. I tuned to 26.471 and heard SAM29000 conversing with Andrews AFB and this went on for nearly an hour. At the time, there was no one from the group on frequency, but mostly Spanish language from who-knows-where.

For you or those that wonder why radio operators like myself go out-of-band to communicate like this . . . what I did back then could never have been accomplished. The friends, letters, QSL cards, gifts from other countries and speaking to people that were educators and local politicians in other small countries could not have happened with that 25 watt radio and three-element beam on channel 38 LSB from anywhere in the U.S.

Will I do it again? I am now a licensed "no coder" so it will be difficult to key up. Things are starting to get interesting on 11 meters here in Florida again. But



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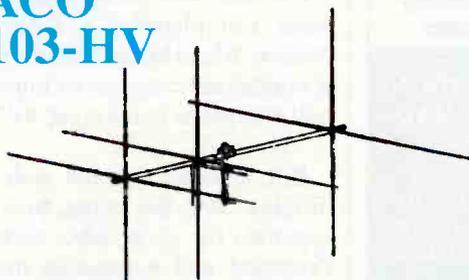
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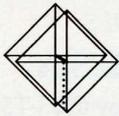
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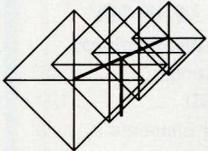
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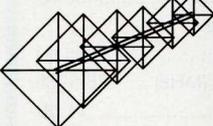
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the mic is not plugged in and the coaxial dipole is only up eight feet. I know I will hear someone from the past. The answer to the question . . . probably will. But I will be steering clear of any known military frequencies in 11 meters and there are plenty of them!

73,

Bill

PS: You will be hearing more from me as I'm planning a DXpedition to Anclote Island here sometime this spring if conditions continue to improve. This will take place in the legal 40!"

Bill, Thanks for the note and the insights. You, like many, have had their appetites for good radio wetted by the Freeband and eventually moved into amateur. Also, like many, the possession of that ticket may deter you from enjoying the Freeband in the future. I can only say that CB, in any form, will be less than it can be if operators like you stay away.

Please keep me informed of your plans for the DXpedition. Of course, even though it will be in the legal 40, none of us will be able to talk to you ;)

## Speaking of Legal - S 608 Update

S 608, a bill before the U.S. Senate, which is hyped as an answer to ending RFI to home entertainment equipment but written as if it were aimed directly at the Freeband, now has a twin in the House. Sponsored by Rep Ehlers of Michigan, HR-2616 has attracted three cosponsors. They are Rep. Coble of North Carolina, Rep. Traficant of Ohio and Rep. Hoestra of Michigan.

While I am embarrassed by the rotten operators who make this legislation appear desirable, I can't support it as written. It would be like trying to feed the hungry by blowing up the bridge to the farm. It shows how willing we are to act. In other words, good intentions - bad legislation. Yes, we need something but baby, this ain't it!

## What We Really Need!

"Ed, I have worked in the broadcasting business for 22 years, and been a ham for quite awhile, so I'm not just some bozo

popping off about this!! I see the problems on CB as another one of our never-ending social problems.

So much talk about new laws to clean up CB, etc, etc. I don't care what anyone says. I started messing with CB in the '60s. The problems never were there until the truckers came on the air around '74. They remind me of a dog using someone else's yard to go to the bathroom! An hour later, they are gone, but their dirty language and no protocol attitude permeates the airwaves. If they had to live in the area, they probably would change their attitude! People can hide their heads in the sand and continue to side step the REAL problem, but you can tune around and hear the main problem!"

Writer's name withheld on request

You sure have a way of putting things! I know where you are coming from, though I can't completely agree with you. I can't because I know too many truckers who are true gentlemen and ladies. They too, find the shenanigans of the above mentioned operators distasteful. They are also quick to point out that all operators that sound like truckers may not be truckers - just jerks.

*"While I am embarrassed by the rotten operators who make this legislation appear desirable, I can't support it as written."*

Where you and I appear to be in complete agreement, is that S 608 won't (can't) do anything to discourage these loud, obnoxious operators. As you point out, truckers are mobile, and being constantly in motion they are therefore in little danger of being identified, let alone caught and prosecuted.

The best, and perhaps only, countermeasure to their constant pollution of our airwaves remains same. We must continue to call crap, crap. We can't, however, be content to be just critics of the wrongdoers. We must demonstrate the alternatives. That means that we must continue to be good and ACTIVE operators.

Well, that is it from here. Thanks for writing me here at the magazine or via the Internet where my address is <edbar-nat@global2000.net>. And as always, if you can . . . catch me on the radio! 73 Ed



## Searching Part II: Trunked Systems And Special Techniques

Last month, we looked at searching with a traditional scanner in the traditional frequency ranges. The new TrunkTracker™ radios from Uniden pose a new horizon for searching. It is difficult to use these radios without at least a cursory run-through of the search mode to find the ID numbers of the trunking system you're interested in hearing. Identifying the dispatch and common use channels should be fairly easy, especially if you're at all familiar with the system that you're monitoring. However, finding some of the more obscure or seldom used talk groups may prove just as difficult, if not more troublesome than finding unknown frequencies.

On the surface, it would appear that searching for talkgroups is fairly straightforward. You know where the frequencies are, and your trunktracker will follow the data channel with no problem. Spending just a few minutes with the radio is likely to turn up 20 or 30 talkgroups without any effort. And these are likely to be the dispatch groups that you're after to begin with anyway. But later, when you start hearing mention of "channels" that you didn't know existed, you may have some more homework to do.

Remember: With a trunking system, there aren't any hidden frequencies to identify (assuming the department you're listening to doesn't have additional capabilities outside the trunking system). Rather, once you're in the trunked mode, all of the frequencies become meaningless, and it's the *ID number of the talkgroup* that matters. There can literally be hundreds of them in even a medium sized system. Talkgroups are the new "channels" in the trunking world; frequencies are incidental once you've found which ones the system uses.

The most efficient search is just to let the radio do the walking. Put it in search mode and watch the screen. In almost no time, you'll have all the common use channels, and that may be enough for you. Great . . . have a good time. But if you're after the detectives, or other groups who

have radios but don't talk much, you're in for quite a hunt. Also, sometimes identifying other users of the system can be quite a challenge.

You can find some channels quickly by just using the search when you know there's going to be activity on a particular channel. For instance, if you hear the dispatcher tell someone to switch to channel 2, you can begin searching until you hear the conversation that you'd expect to find on channel 2. It won't work all the time, because sometimes those conversations are very short, and sometimes other traffic will interfere, but it's a helpful technique to identify just a few more talkgroups as you go forward.

### Using the Lockout Function

Once you've exhausted this method, the best method of searching for new "infrequent use" channels, and identifying the channels that are part of other systems, is to make good use of the lockout function. As you begin your search, you'll already know some of the channels and their use. Lock those out as they appear. This way, the radio won't be tied up with traffic from routine channels that you already know about while an interesting conversation takes place on a channel that you don't.

One of the major problems with this method is that it is not very easy to switch in and out of this mode. The way the trunktracker radios handle lockouts is to lock out a talk group universally. Once you lock out a particular talk group in the search mode, that talk group is also locked out in the scan mode when you get

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***"When you start hearing mention of 'channels' that you didn't know existed, you may have some more homework to do."***

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tired of searching. You have to unlock everything and start from scratch next time you want to search again. All lockouts can be eliminated by pressing and holding the lockout key until it beeps twice, and then pressing enter.

If you're using Uniden's TrunkTracker™ equipment, currently there's no way to do this unattended. Computer software available for the 895 as of this writing does not work in the trunked mode. And on the 235, there is no interface. I understand that other software and hardware combinations will allow for logging of trunked information, but I have not been able to test any of these systems.

### What IS the frequency, Kenneth?

Another search problem for trunktracker users is finding and identifying channels that belong to an unknown system. New systems are being installed all the time, and the FCC records, and therefore the reference guides that are published, may not be of much help. It is worth a search of a particular licensee

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## A Handy Frequency Step Chart

Part of the art of searching involves knowing where to look. If you can use the right channel plan, you can cut down the number of possible frequencies that you have to plow through, and increase your results. Below is a chart of the allotted frequencies, and the correct search steps to use. There are a few exceptions to these rules, but by and large if your scanner has the capability to set the step rate, and you start off on the right frequency to begin with, you'll have much better luck using these search/step combinations.

As an example, most scanners default to 5 kHz steps in the VHF high band. And if you search in 5 kHz steps through the entire range, you'll hit every possible channel - and twice as many that are not likely to be used. Your scanner will be doing three times as much work as it has to, and spending fully two-thirds of its time on frequencies that are not likely to be in use. If you can set the step rate to the correct 15 kHz, you'll get results much faster.

Lower (MHz)	Upper (MHz)	Mode/Step	Use/Notes
25.0200	25.3200	NFM 20.000	Petroleum Industry
25.87	26.07	NFM 40.00	Remote Broadcast
26.09	26.47	NFM 20.00	
26.9650	27.4050	AM 10.000	CB Radio
27.4300	27.5300	NFM 20.000	
28.0000	29.7000	Any None	Amateur Radio 10M
29.7100	29.7900	NFM 20.000	
29.900	29.55	Any 10.00	Federal
30.580	31.980	NFM 20.000	
32.0100	32.9900	Any 10.00	Federal
33.0200	33.980	NFM 20.000	
34.0100	34.9900	Any 10.000	Federal
35.0200	35.980	NFM 20.000	
36.0000	36.9900	Any 10.000	Federal
37.0200	37.98	NFM 20.000	
40.00	41.99	Any 10.00	Federal
42.02	46.600	NFM 20.00	
46.6100	46.9700	NFM 20.00	Part 15 Services (Cordless Phones, Misc.)
47.0200	49.580	NFM 20.000	Part 15 Services, Misc. Business
49.6700	49.9900	NFM 20.00	Part 15, Misc. Federal on other steps
50.0000	54.0000	varies varies	Amateur Radio 6M
54.0000	72.0000	WFM 6000.00	Television Broadcast
59.750		WFM	Channel 2 Audio
65.750		WFM	Channel 3 Audio
71.750		WFM	Channel 4 Audio
72.0000	76.0000	NFM 20.000	Operational Fixed
76.0000	88.0000	WFM 6000.00	Television Broadcast
81.750		WFM	Channel 5 Audio
87.750		WFM	Channel 6 Audio
88.1000	107.9000	WFM 200.00	FM Broadcast
108.0000	137.000	AM 25.00	Aircraft
138.0000	144.0000	NFM Varies	Federal (5 kHz Steps to search)
144.0000	148.0000	varies varies	Amateur Radio 2M
148.0000	150.7000	NFM varies	Federal (5 kHz Steps to search)
150.775	150.790	NFM 15.00	
150.8150	151.610	NFM 15.00	
151.6250	151.9550	NFM 30.000	Business Radio Service, Itinerants
151.9850		NFM	Telephone Maintenance Radio Service
152.0075		NFM	Special Emergency Radio Service paging
152.0300	152.840	NFM 30.000	Older Mobile Phone system, paging
152.8700	154.490	NFM 15.000	
154.515	154.625	NFM varies	5 kHz (Mostly Business services)
154.650	156.255	NFM 15.00	Public Safety, Local Government
156.2750	157.450	NFM 25.000	VHF Maritime
157.4700	157.740	NFM 15.000	
157.7700	158.100	NFM 30.000	Older Mobile Phone system, paging
158.1300	158.460	NFM 15.000	Power/Petroleum/Forest Products
158.4900	158.700	NFM 30.000	Older Mobile Phone system, paging
158.7300	160.200	NFM 15.00	Public Safety, Business (Trucking)
160.215	161.565	NFM 15.000	Rail Road AAR Channels
161.600		NFM	
161.6400	161.7600	NFM 30.000	Broadcast Remotes
161.800	162.000	NFM 25.000	Marine Telephone
162.0125	173.200	Any 12.500	Federal
173.2250	173.3750	NFM 25.000	Press, Business

173.3875	173.9875	Any 12.500	Federal
174.0000	216.0000	WFM 6000.00	Television Broadcast Chs. 7-13
179.750		WFM	Channel 7 Audio
185.750		WFM	Channel 8 Audio
191.750		WFM	Channel 9 Audio
197.750		WFM	Channel 10 Audio
203.750		WFM	Channel 11 Audio
209.750		WFM	Channel 12 Audio
215.750		WFM	Channel 13 Audio
222.0000	225.0000	varies	Amateur Radio (1.25 meters)
225.0000	400.0000	AM 100.000	Military (Some new channels appearing in between, Other modes can appear)
400.0000	406.0000	None	Space
406.125	420.0000	NFM 12.50	Federal
420.0000	450.0000	ANY None	Amateur Radio 70CM
450.0500	450.925	NFM 12.50	Broadcast Auxiliary
451.025	457.475	NFM 12.500	Business, Industrial
457.525	467.525	NFM 12.500	Public Safety, Business, Misc
467.5500	467.925	NFM 12.500	GMRS, FRS, Business
467.9500	469.975	NFM 12.500	
470.0000	512.0000	WFM 6000.00	Television Broadcast chs 14-20 (This band can be assigned for public safety use in some areas)
475.7500		WFM	Channel 14 Audio
481.750		WFM	Channel 15 Audio
487.750		WFM	Channel 16 Audio
493.750		WFM	Channel 17 Audio
499.750		WFM	Channel 18 Audio
505.750		WFM	Channel 19 Audio
511.750		WFM	Channel 20 Audio
512.0000	806.0000	WFM 6000.00	Television Broadcast Chs 21-69
517.750		WFM	Channel 21 Audio
523.750		WFM	Channel 22 Audio
529.750		WFM	Channel 23 Audio
535.750		WFM	Channel 24 Audio
541.750		WFM	Channel 25 Audio
547.750		WFM	Channel 26 Audio
553.750		WFM	Channel 27 Audio
559.750		WFM	Channel 28 Audio
565.750		WFM	Channel 29 Audio
571.750		WFM	Channel 30 Audio
577.750		WFM	Channel 31 Audio
583.750		WFM	Channel 32 Audio
589.750		WFM	Channel 33 Audio
595.750		WFM	Channel 34 Audio
601.750		WFM	Channel 35 Audio
607.750		WFM	Channel 36 Audio
613.750		WFM	Channel 37 Audio
619.750		WFM	Channel 38 Audio
625.750		WFM	Channel 39 Audio
631.750		WFM	Channel 40 Audio
637.750		WFM	Channel 41 Audio
643.750		WFM	Channel 42 Audio
649.750		WFM	Channel 43 Audio
655.750		WFM	Channel 44 Audio
661.750		WFM	Channel 45 Audio
667.750		WFM	Channel 46 Audio
673.750		WFM	Channel 47 Audio
679.750		WFM	Channel 48 Audio
685.750		WFM	Channel 49 Audio
691.750		WFM	Channel 50 Audio
697.750		WFM	Channel 51 Audio
703.750		WFM	Channel 52 Audio
709.750		WFM	Channel 53 Audio
715.750		WFM	Channel 54 Audio
721.750		WFM	Channel 55 Audio
727.750		WFM	Channel 56 Audio
733.750		WFM	Channel 57 Audio
739.750		WFM	Channel 58 Audio
745.750		WFM	Channel 59 Audio
751.750		WFM	Channel 60 Audio
757.750		WFM	Channel 61 Audio
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775.750		WFM	Channel 64 Audio
781.750		WFM	Channel 65 Audio

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name, or call sign if you can find that information based on the licensed user of the data channel, but even that's not always available immediately. You may have the data channel, because it's relatively easy to find with a conventional scanner, but have no idea where the associated frequencies are. Gone forever are the days of nice one MHz spacing on all the associated channels.

Here's where a wait-and-see attitude may finally have to prevail. Unless you can find license data from one of the reference guides, or have inside information from a user of the system, you're going to have a hard time finding the individual channels. It can be done by traditional searching methods, but is truly a monumental trial and error task. Good luck.

### A Great Example

James Schoor from Rosemount, MN wrote in with a great example of exactly this particular problem; how to figure out what's what. James explains the problem: "I just bought a BC-895XLT and I want

787.750		WFM	Channel 66 Audio
793.750		WFM	Channel 67 Audio
799.750		WFM	Channel 68 Audio
805.750		WFM	Channel 69 Audio
806.0125	823.9875	NFM 12.500	Mobiles
824.0400	834.9900	NFM 30.000	Cellular - Non-wireline Mobile
835.0200	848.9700	NFM 30.000	Cellular - Wireline Mobile
849.0550	850.9735	AM 6.000	Mobile Telephone - Aircraft ground
851.0125	868.9875	NFM 12.500	Base
869.0400	879.9900	NFM 30.000	Cellular - Non-wireline Base
880.0200	893.9700	NFM 30.000	Cellular - Wireline Base
894.0055	895.9735	AM 6.000	Mobile Telephone - Aircraft airborne
895.0125	901.9875	NFM 12.500	Mobiles
902.0000	928.0000	All None	Amateur Radio 33CM
928.0000	929.0000		Private Fixed Service
929.0125	931.9875	NFM 25.000	Paging
932.0000	935.0000		Fixed
935.0125	939.9875	NFM 12.500	Base



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to monitor my local SMRs . . . (Nextel has) four control channels and a total of 115 frequencies. How can I tell which frequencies belong to which system?"

Oh boy, that's going to be a tough one. In the good old days, frequencies were issued in blocks of 5 that were exactly 1 MHz apart. However, since the 800 band has gotten so popular, and not everyone needed even blocks of 5 - it's pretty much anything goes these days. The first thing I would do is isolate any groups of the 115 that are 1 MHz apart and assume (at least for the beginning) that those channels go together someplace. If one or more of them happens to be a control channel, that might help too. Beyond that, I don't know of any reliable method for determining which frequencies are using what with the trunktrackers. I understand that some of the other systems available might be able to help, but I have not had an opportunity to work with any of these systems as of yet. I'll keep you posted, but in the meantime, good luck.

### Another Good Question

And Eric Hopkins writes in with another trunking question, saying " . . . It seems plausible to me that it should be possible to incorporate the programming needed to run a non TrunkTracker™ equipped scanner in trunktracker mode, utilizing a software package and an external interface, via a PC."

Well, Eric, yes. There is a system called TrunkTrac developed by Greg Knox, the same guy that did the trunktracker system for Uniden. It's available in two versions, one for standard users and one for professionals. We hope to do a review shortly and will fill you in on the details, but for now the details are available by contacting: Scanner Master at P.O. Box 610428, Newton Highlands, MA 02161, or on the web at <[www.scannermaster.com](http://www.scannermaster.com)>.

### We Need Your Input!

I'm always looking for your comments and questions. Got any search results to let us in on? Pictures of your shack? One of our upcoming topics involves setting up a shack for efficient and convenient operation, and I would like to see any particularly efficient or ingenious layouts that you may have. Send them in! ■

# The Listening Post

WHAT'S HAPPENING: INTERNATIONAL SHORTWAVE BROADCASTING BANDS

## New Argentine Station On the Air!

There's no need for shortwave fans to "cry for Argentina" at the moment. For the first time in just about anyone's memory there's a new station on the air from this country! **Radio America Internacional** has been running test broadcasts on **15280** between about 2200 and 0000. The full schedule hasn't been announced yet but it's expected to run about 16 hours per day and include programming in English and Portuguese, as well as the Spanish you'd expect. It should be in full operation by the time you read this. The station is apparently renting a facility at Argentina's General Pacheco transmitting site where the Radio Nacional (LRA) transmitters are (as well as some utility communications transmitters). Initially, anyway, the power used is about 30 kW. One of the announcers is Jose Hallowaty, who

used to work for the now defunct KGEI shortwave near San Francisco. Mail for the station can be sent to: Intendente Abel Costa 289, 1708 Moron, Argentina.

WVHA (originally WCSN) has been purchased by LeSea Broadcasting (WHRI-Indiana and KWHR-Hawaii) for \$1.5 million. The new call letters are WHRA (World Harvest Radio-Africa) and it should be in operation by now. The Middle East is a second target areas. No frequency usage has been announced but they may use the previous WVHA channels so check out those for a start.

### No Thanks!

Australia has said "no thanks" to our government's wish to buy time for its Radio Free Asia broadcasts on transmitters at Australia's Darwin site. The neg-



*Happy New Year From China Radio International!*

ative response was partly because Australia did not want to upset China, one of RFA's main targets; and also because the "run" was to last just a few months and the Australians said it would not have been profitable to "de-mothball" the transmitters for that short a period. So the

**20 Jahre  
Deutsche Welle**

Köln, den 30. VIII. 74

Wir danken Ihnen für Ihren Empfangsbericht und bestätigen Ihnen gern die Richtigkeit Ihrer Beobachtung. Sie hörten unseren Sender **Wertachtal**

am: 17. VIII. 74

um: 0130 GMT

auf: 9690 kHz

Thank you for your reception report which has been checked with our schedules and found to be correct. We are very glad to verify herewith your report.

Mr. Andy Johns

DEUTSCHE WELLE  
HA Hochfrequenz

*Stiele*

*This DW card confirmed reception of the Wertachtal site for Andy Johns of Texas back in 1974.*

Darwin facilities continue to sit silent, awaiting a suitable situation.

It looks, too, as if Radio Australia QSL cards will be hard to get from now on. The station's Transmission Management Unit says that, while it still welcomes reports, it no longer has the time or money to send out QSLs.

A new station in Liberia is **Radio Veritas**, operating on **3450** and using the slogan "we are the voice of truth" broadcasting from the Catholic Media Center in Monrovia. The 10 kW shortwave is mostly a relay of their local FM station on 97.8 MHz. The schedule on shortwave runs from 0445 to 1100 on **3450** (check **3425**, too) and **5470**, 1300 to 1500 on **5470** and 1800 to 0000 on **3450**. Most North American listeners ought to be able to pick up the 0445 segment under reasonably good conditions and east coasters should find them during the winter months from 2200 or 2300. Their address is: c/o The Catholic Mission, P.O. Box 3569, Monrovia, Liberia and they welcome reception reports.

Another "newish" Liberian station is Star Radio, which uses only 4 kW and operates on **3400** from 0500 to 0800 and **5880** from 1700 to 2000. This station is also located in Monrovia and is funded in part by the US government's USAID program, although it is run by the Swiss based NGO Fondation Hirondelle. The programming here also appears to be a relay of a local FM station. The address is Star Radio, Sekou Toure Avenue, Mamba Point, Monrovia, Liberia.

A third and somewhat older Liberian shortwave station is **Radio Liberia** which operates on **5100** from 1800 to 0200 and 0500 to 0800 and often comes through very well.

And, eventually, we could even see the return of ELWA, the well known religious broadcaster which broadcast from Liberia for decades but was destroyed during a civil conflict, some years ago. The station later returned to the air and then had to be abandoned again during another civil conflict.

In another cutback, **Radio Prague** has ended its transmissions in German, French and Spanish. 27 minute English broadcasts to North America continue at 1400 on **13580**, 2100 on **5930**, and 2230, 0000 and 0300 on **5930** and **7345** and 0100 on **6200**.

Some of the English broadcasts from **Swiss Radio International** are now packaged in one hour blocks. That includes the one to North America at 0400



*This card was one of a series of seven issued Radio Netherlands in 1975 marking the 7<sup>th</sup> century of the city. (Thanks to Andy Johns)*

on **6135**, **9885** and **9905**. Other English aimed in our direction is at 010-0130 on the same frequencies. Incidentally, the transmitter site at Schwarzenberg has closed.

Has the **Voice of Kenya** rejuvenated - or even replaced their shortwave transmitters? What used to be more or less seasonal and, at best so-so reception from the Voice of Kenya on **4935**, now seems not only to be regular but quite strong, even very strong at times. Whatever the reason, we can only hope that it's not a fluke. Sign on time is at 0200. During the winter well positioned east coast DXers can hear also

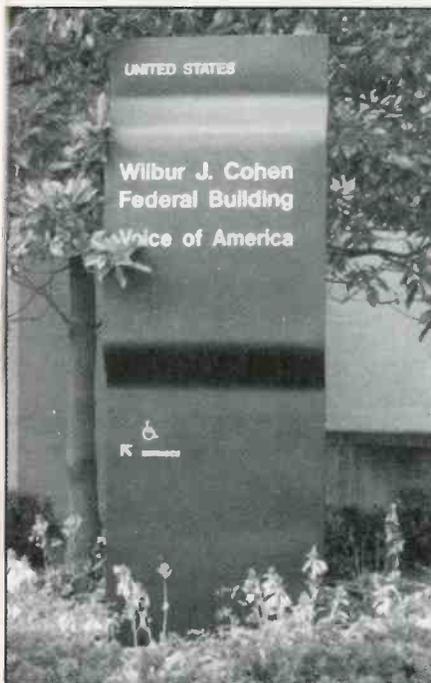
hear this during in the mid-afternoon.

Remember that your informational input is forever welcome. Please list your logs by country and double space between each item so they can be cut and sorted more easily. Also be to include your last name and state abbreviation after each item.

We also appreciate receiving listener's DX shack pictures and shortwave stations photos, as well as extra QSL cards you don't need returned, station schedules and other news, info about station QSL policies and address changes. We're always grateful for your participation!



*An announcer at Sani Radio in Puerto Lempira, Honduras which, though active a few years ago, seems to be off the air now.*



*This familiar style sign announces the William J. Cohen Federal Building, home to the Voice of America*

Here are this month's logs. All times are in UTC, which is five hours ahead of EST, i.e. 0000 UTC equals 7 p.m. EST, 6 p.m. CST, 5 p.m. MST and 4 p.m. PST. Double capital letters are language abbreviations (FF=French, AA=Arabic, SS=Spanish, etc.). If no language abbreviation is included the broadcast is assumed to have been in English.

**ANGOLA** - VORGAN, 6220 at 2020-2100 close, in PP with hi-life and pops, ID, national anthem at 2100. Frequency given as 6220. (Rausch, NJ)

**ANGUILLA** - Caribbean Beacon, 6090 at

#### Abbreviations Used in Listening Post

AA	Arabic
BC	Broadcasting
CC	Chinese
EE	English
FF	French
GG	German
ID	Identification
IS	Interval Signal
JJ	Japanese
mx	Music
NA	North America
nx	News
OM	Male
pgm	Program
PP	Portuguese
RR	Russian
rx	Religion/ious
SA	South America/n
SS	Spanish
UTC	Coordinated Universal Time (ex-
GMT)	
v	Frequency varies
w/	With
WX	Weather
YL	Female
//	Parallel Frequencies

0028 with Gene Scott. (Jeffery, NY)

**ANTIGUA** - BBC to America and Europe on 5975 at 0400 with Newsdesk. (Jeffery, NY) Deutsche Welle relay, 6185 at 0525. (Foss, AK) 15295 at 1319 in GG. (Harris, TN)

**ALGERIA** - Radio Algiers Int'l (presumed) on 15160 at 1426 in unidentified language. Music, woman announcer. No ID and soon faded. (Jeffery, NY) 1600 with QSL address, news, music. (Gale, NC) 1606 with pops, EE ID, world news. (Lamb, NY)

**ARGENTINA** - RAE, 15345 at 2055 with Argentine music, talk in presumed Italian, piano IS, time pips, ID, synthesizer IS and multi-lingual ID over music. (Lamb, NY) LOL time station, 10000 with CW ID at 2259. (Rausch, NJ)

**ASCENSION ISLAND** - BBC to Africa, 9600 at 0347 with "Network Africa." 15400 at 2000. (Jeffery, NY) 15390 to Caribbean at 2116 to 2130 close. (Harris, TN) VOA to Africa, 11855 at 2016. (Harris, TN)

**AUSTRALIA** - Radio Australia, 6080 at 1240 and 9415 at 1300 with news. 1335. (Northrup, MO) (Miller, WA) 9415 at 1235 with African music, ABC news at the top of the hour. (Lamb, NY) 1505 with classical music. (Wilden, IN)

**BENIN** - Radio Benin (presumed) 4870 at 2115 in FF, excerpt from speech, presumed news with mentions of Cotonou. (Lamb, NY)

**BOSNIA** - Radio Yugoslavia, 6100 at 22325 with pops, English ID and frequency/schedule, IS and off at 2329. (Lamb, NY) 9580 at

0026 in local language, IS. (Miller, WA)

**BOTSWANA** - Radio Botswana, 7255 at 0423 with Afropops, presumed SeTswana, language, ID. (Lamb, NY) VOA relay, 9775 at 0407 and 9885 at 0404. (Harris, TN)

**BRAZIL** - Radio Aparecida (presumed) 9630 at 0105 in PP with contemporary Christian music and man with religious talk, possible ID. (Lamb, NY) Radio Brazil Central, 4985 in PP at 2343 with talk, ID, presumed address read by woman. (Lamb, NY) Radio Nacional do Amazonia, 11780 in PP at 2336 with music requests. (Miller, WA)

**BULGARIA** - Radio Bulgaria, 9700 at 2048 with "Country Review." (Harris, TN)

**CAMEROON** - RTV Cameroon, Buea. (presumed), 4850 at 2121 with hi-life, FF announcements. (Lamb, NY)

**CANADA** - Radio Canada Int'l, 9805 at 2028 in FF and 15150 at 2030 in EE. (Harris, TN) CBC Radio Two, 9625 at 1607. (Wilden, IN) Radio Korea Int'l relay, 9650 at 1129 with IS, ID, time/frequency info, news and "Short-wave Feedback." (Jeffery, NY) BBC relay, 5965 at 1200, 6175 at 0147 and 9515 at 1522. (Jeffery, NY) 6175 at 2343 and 9515 at 1512. (Harris, TN)

**CHAD** - RDF Tchadienne, 4905 at 2115 with African music, ID at 2121. (Lamb, NY)

**CHINA** - China Radio Int'l, 9690 (via Spain) at 0352. (Harris, TN) BPM time station, 10000 at 2359 with CW and

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### Applied for Permit to Construct New AM Station

HI Honolulu 1130 kHz 10/6 kW

### Applied for Permits to Construct New FM Stations

AL	Hueytown	88.1 MHz	
AL	Marshalltown	88.7 MHz	
AL	Northport	88.1 MHz	
AR	Greenwood	101.5 MHz	
AZ	Parker	93.9 MHz	
CA	Berkeley	102.9 MHz	(KBLX-FM booster)
CA	Bishop	88.5 MHz	900 watts
CA	Redwood Valley	88.1 MHz	
CA	Ridgecrest	91.9 MHz	7.5 kW
CA	Truckee	101.5 MHz	
CO	Dolores	93.3 MHz	
CO	Durango	105.3 MHz	
CO	Montrose	88.3 MHz	5 kW
CO	Pueblo	89.9 MHz	870 watts
CO	Steamboat Spgs.	98.9 MHz	
DC	Washington	87.9 MHz	(Exp. DAB)
FL	Marathon	89.3 MHz	
FL	Quincy	90.1 MHz	20 kW
GA	Dawson	98.1 MHz	
GA	Montezuma	95.1 MHz	
IA	Dubuque	90.1 MHz	810 watts
IA	Marion	89.9 MHz	1.25 kW
IA	Waverly	88.9 MHz	6 kW
ID	Orofino	98.5 MHz	
ID	Parma	90.9 MHz	
IL	Duquoin	90.1 MHz	6 kW
IL	Geneso	88.1 MHz	2 kW
IL	Lexington	99.5 MHz	
IL	Taylorville	88.9 MHz	2 kW
IN	Hardinsburg	98.7 MHz	
IN	Wakarusa	89.9 MHz	
KS	Bronson	88.3 MHz	
KS	Great Bend	89.7 MHz	250 watts
KS	Riley	96.3 MHz	
KS	Winfield	91.9 MHz	250 watts
LA	DeRidder	91.1 MHz	250 watts
MD	Snow Hill	101.1 MHz	
MI	Harrisville	89.7 MHz	
MI	Imlay City	88.1 MHz	5.4 kW
MI	Manistique	99.9 MHz	
MN	Deer River	105.5 MHz	100 kW
MN	Mahnomen	101.5 MHz	
MO	Macon	99.9 MHz	
MO	Perryville	89.1 MHz	
MS	Liberty	107.7 MHz	
MT	Great Falls	90.7 MHz	
MT	Superior	107.5 MHz	
NC	Raeford	88.7 MHz	
NC	Scotts Hill	88.3 MHz	
ND	Bismarck	91.5 MHz	
ND	Hope	104.7 MHz	
NE	Imperial	102.9 MHz	
NJ	Cape May C.H.	88.1 MHz	550 watts
NM	Kirkland	102.9 MHz	100 kW
NV	Beatty	100.3 MHz	
NY	Lyon Mtn.	89.7 MHz	190 watts
OH	Canton	90.1 MHz	
OH	Portsmouth	107.5 MHz	

OH	Rushville	88.5 MHz	1 kW
OK	Kingfisher	103.5 MHz	
OK	Polola	88.1 MHz	
OR	Bend	99.7 MHz	
OR	Sisters	89.3 MHz	
PA	Ohio Pyle	89.1 MHz	
SD	Rapid City	88.3 MHz	
TX	Big Spring	89.3 MHz	3 kW
TX	Bridgeport	90.5 MHz	
TX	Brownfield	88.5 MHz	
TX	Brownwood	89.3 MHz	
TX	Freer	90.7 MHz	
TX	Levelland	91.9 MHz	
TX	Paris	89.3 MHz	6 kW
TX	Plainview	88.5 MHz	
TX	Temple	88.5 MHz	250 watts
TX	Thorndale	99.3 MHz	
TX	Victoria	91.5 MHz	4.1 kW
UT	Huntsville	103.1 MHz	
UT	Weston	95.9 MHz	
VA	Chincoteague	96.5 MHz	
VA	Emporia	89.3 MHz	
WA	Clarkston	88.1 MHz	
WI	Wentworth	88.5 MHz	
WY	Buffalo	90.5 MHz	
WY	Flendo	100.1 MHz	
WY	Midwest	107.9 MHz	

### Granted Permits to Construct New FM Stations

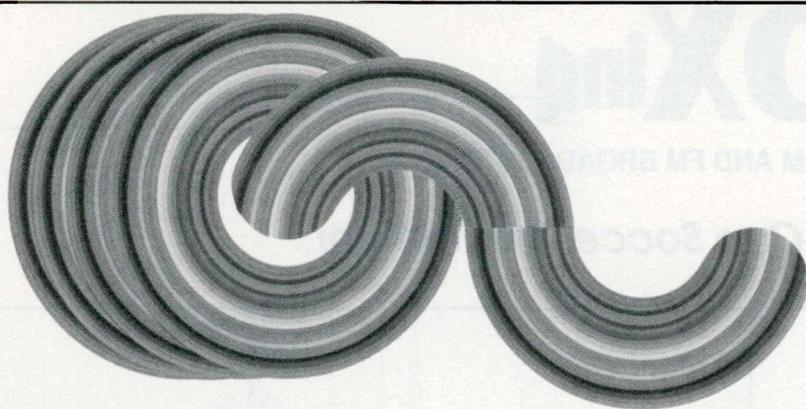
GA	Mableton	102.5 MHz	3 kW
IL	Tower Hill	98.3 MHz	2.89 kW
MA	Woods Hole	90.1 MHz	8 kW
MN	Grand Marais	90.7 MHz	25 kW
MN	Starbuck	97.3 MHz	50 kW
MO	Warsaw	98.5 MHz	3 kW
NC	Atlantic Beach	91.5 MHz	26 kW
ND	Fargo	88.7 MHz	
VA	Wise	90.5 MHz	
WY	Albin	107.3 MHz	

### Cancelled

KBYG-FM	Coahoma, TX	105.5 MHz	6 kW
WADW	Pickford, MI	105.5 MHz	6 kW
WXVU-1	Villanova, PA	89.1 MHz	(booster)

### Requesting Changed AM Facilities

KELY	Ely, NV	1230 kHz	Seeks to change power
KEYH	Houston, TX	850 kHz	Seeks to add 185 watt night ops
KGHF	Pueblo, CO	1350 kHz	Seeks to change power
WAKM	Franklin, TN	950 kHz	Seeks day increase to 2.5 kW
WCHB	Taylor, MI	1200 kHz	Seeks night increase to 15 kW
WVSR	Charleston, WV	1240 kHz	Seeks to change community
WWLS	Moore, OK	640 kHz	Seeks day increase to 5 kW
WWWE	Carrollton, GA	1100 kHz	Seeks move to Hapeville, 5 kW



## QSL Bayerischer Rundfunk

*One of the many extremely attractive QSLs issued by German SW broadcaster Bayerischer Rundfunk over the years.*

woman to anthem and ID at 2230. A first log for me – and via long path! (Rausch, NJ)  
**MALI** – RTV Malienne, **4835** at 2125; talk over guitar, brass band, male announcer in FF. Parallel **5995**. (Lamb, NY)  
**MOROCCO** – Voice of America relay, **6150** at 0803 in EE and unidentified language. Off at 0830. Also **17895** at 1803. (Jeffery, NY)  
**MEXICO** – Radio Educacion, **6185** in SS at 0051 with Spanish folk music. (Miller, WA) Radio Mexico Int'l, **9705** at 2051. (Harris, TN) 0052 in SS with song, time check, program line-up. (Lamb, NY)  
**NIGERIA** – Voice of Nigeria, **7255** at 0524 with African instrumentals. (Foss, AK) Radio Nigeria, Kaduna, **4770** heard at 2109 with news, mention of "Radio Links" program and phone numbers, "This network news half hour is coming to you from Radio Nigeria." (Lamb, NY)  
**NETHERLANDS ANTILLES** – Radio Netherlands, **6020** at 2335. (Harris, TN) **17605** at 1932 with news. (Jeffery, NY)  
**NEW ZEALAND** – Radio New Zealand Int'l, **9700** at 1009 with weather, ID "This is Radio New Zealand International, broadcasting from Wellington." (Foss, AK) 1129 with ID, promo, arts program. Also **15115** at 0314. (Jeffery, NY) **9810** at 1651 with IS and ID "This is the Pacific service of Radio New Zealand International." Also **15115** at 2139. (Miller, WA)  
**NORTH KOREA** – Korean Central Broadcasting Station, **9665** at 0533 with Korean female pop singer. (Foss, AK)  
**NORWAY** – Radio Norway Int'l, **7485** at 0359. Music, fanfare, multi-lingual ID. (Widen, IN)  
**PAPUA NEW GUINEA** – NBC, Port Moresby, **4890** at 1318 EE pops and Pidgin. (Miller, WA)  
**PARAGUAY** – Radio Nacional, **9735** at 0028 in SS. (Miller, WA) **9736** at 0039 with accordion and guitar, talk in SS. (Lamb, NY)  
**PERU** – Radio Horizonte, Chachapoyas, **5019** in SS at 0100. (Gale, NC) **5020** at 1003

in SS with music, ID. (Jeffery, NY)  
Radio Onda Azul, Puno, **4801** in SS at 0917 with music, man with ID. (Jeffery, NY)  
Radio Andina, Huaraz, **4995** at 2319 with uptempo Peruvian music, SS talk, IDs, possible commercial, mentions of Huancayo. (Lamb, NY)  
La Voz de la Selva, Iquitos, **4824** in SS at 1013 with music. Barely audible. (Jeffery, NY)  
**PHILIPPINES** – Voice of America relay, **17735** heard at 2319 and on **17820** at 2309. (Jeffery, NY)  
**PORTUGAL** – Radio Portugal Int'l, **6150** at 0332 with time and frequency info, news, weather, ID. Also **9570** at 0323 in PP with music. Into EE at 0331. (Jeffery, NY)  
**ROMANIA** – Radio Romania Int'l, **7145** at 0108 with news in FF. (Wilden, IN)  
**RUSSIA** – Voice of Russia, **7305** at 2141 with talk about poetry in Moscow's subways. (Lamb, NY)  
Radio France Int'l, via Irkutsk, **7305** at 1121 in Asian language, pops, ID in FF at 1131. (Lamb, NY)  
Magadan Radio, **5940** at 0740 with classical music. (Foss, AK)  
**SAO TOME** – Voice of America relay, **6035** at 1955 with steel drums, talk, editorial. (Lamb, NY)  
**SEYCHELLES** – Far East Broadcasting Association, **9810** at 1702 in unidentified language. (Miller, WA)  
BBC relay, **6005** at 2023 with "Newshour." (Lamb, NY)  
**SINGAPORE** – Radio Singapore Int'l, Kranji, **6015** at 1236. (Miller, WA)  
BBC relay, **9740** at 1215. (Lamb, NY) 1500 with "East Asia Today." (Jeffery, NY)  
**SOLOMON ISLANDS** – Solomon Islands Broadcasting Corp., **5020** at 0749 with song. (Foss, AK)  
**SOUTH AFRICA** – Channel Africa, **15240** at 1659 with ID, IS, time pips and "7 o'clock here in South Africa." news. Also **17675** at 1434 with African vocals, EE talk and ID. (Lamb, NY)

BBC Meyerton relay, **6135** at 2036 in PP with ID, presumed news. (Lamb, NY) **6195** at 1323. (Boulden, CA) Trans World Radio, Meyerton relay, **9510** at 1837 in unidentified language. African children's chorus, religious lessons and prayers. (Miller, WA)  
**SPAIN** – Radio Exterior de Espana, **6055** at 0551 with song in SS. A real "RF duel" here as Radio Tampa (Japan) had a very strong signal on the same frequency. (Foss, AK) 0140 with interview, classical music. (Wilden, IN) 0416 in SS. (Harris, TN)  
Radio Liberty, **7220** at 0045 with jazz program and announcer in RR. "Radio Svoboda" ID and IS at top of the hour. (Lamb, NY)  
China Radio Int'l relay on **9690** heard at 0333 with program on CRI's 50<sup>th</sup> anniversary. (Jeffery, NY)  
**SWEDEN** – Radio Sweden, **11650** at 1231 with news, "60 Degrees North." (Wilden, IN)  
**SWITZERLAND** – Swiss Radio Int'l, **6135** at 0315 in SS. (Wilden, IN)  
**SWAZILAND** – Trans World Radio, Manzini, **9600** at 1823 with IS and "You are tuned to Trans World Radio." Into FF at 1832. (Miller, WA)  
**TAIWAN** – Broadcasting Corporation of China, **9610** in CC at 0732. (Foss, AK)  
Voice of Free China, via WYFR, **5950** at 0301 with ID and frequencies. (Wilden, IN) 0345. (Jeffery, NY) 0349. Also **9680** in CC at 0414. (Harris, TN)  
**THAILAND** – Radio Thailand, **7285** at 1113 in possible Asian language, IS, ID in EE with announcement of upcoming Khmer broadcast. (Lamb, NY)  
**UKRAINE** – Radio Ukraine Int'l, **7150** at 0101 with IS, EE ID, program line-up, news. (Lamb, NY)  
**UNITED ARAB EMIRATES** – UAE Radio, Dubai, **13675** at 1329 with ID, frequency info, news. Also **21605** heard at 1514 in AA with Middle-Eastern music, woman announcer. (Jeffery, NY)  
**VATICAN CITY** – Vatican Radio, heard at **0305** on **7300** with talk and program promo. (Wilden, IN)  
**VENEZUELA** – Ecos del Torbes, **4980** in SS at 0310. Music in SS. (Wilden, IN)  
**VIETNAM** – Voice of Vietnam, via Russia, **5940** at 0230 with news. (Gale, NC)  
Presumed, on **12020** at 2238 in VV. Possible ID, talk by man, mentions of Washington. (Lamb, NY)

And there you have it! A great selection of goodies from a great bunch of folks. Let's give them a roaring round of applause for their good works.

Paul Harris, Columbia, TN; Dave Gale, Newland, NC; Ed Rausch, Cedar Grove, NJ; Marty Foss, Talkeetna, AK; Brian Boulden, Fairfield, CA; Marie Lamb, Brewerton, NY; Lee Silvi, Mentor, OH; Sue Wilden, Columbus, IN; Michael J. Miller, Issaquah, WA and Dave Jeffery, Niagara Falls, NY. Thanks to each of you!  
Until next month, good listening! ■

# Broadcast DXing

DX, NEWS AND VIEWS OF AM AND FM BROADCASTING

## World Cup Soccer Excitement

Qualifying matches for the France '98 World Cup Soccer tournament have been completed. Teams from 32 countries including the United States have qualified. First round matches will be held June 10-26, second round June 27-30, finals July 3, 4, 7, and 8, and the championship is on July 12. Teams are divided into eight pools for the first round of competition. The top two teams from each pool will advance to the second round.

### First Round Pools

Pool A: Brazil, Morocco, Norway, Scotland

Pool B: Austria, Cameroon, Chile, Italy

Pool C: Denmark, France, South Africa, Saudi Arabia

Pool D: Bulgaria, Nigeria, Paraguay, Spain

Pool E: Belgium, Mexico, Netherlands, South Korea

Pool F: Germany, Iran, United States, Yugoslavia

Pool G: Colombia, England, Romania, Tunisia

Pool H: Argentina, Croatia, Jamaica, Japan

There will be plenty of excitement across the AM dial this summer, as many of the competing countries can be heard in North America. Here are some long-wave and AM broadcast band targets:

**Belgium:** RVI Wolvertem-1512.

**Cameroon:** CRTV; 1152, 1286, on "old plan" frequencies, but still very rare and difficult catches.

**Colombia:** CARACOL network; 700, 810, 1100, 1170, RCN network; 760, 770, 1000.

**Croatia:** Hrvatska Radio-Televizija; 1125, 1134.

**Denmark:** Danmarks Radio - 1062.



The studios and transmitter site for WNFL. (Photo by U.R. Albrecht)

**England:** BBC Radio 5 Live - 693, 909, BBC Wales - 882, Talk Radio - 1053, 1089.

**France:** "98 Radio France" special events broadcasts from Allouis-162.

**Germany:** 756, 1017, 1422.

**Italy:** RAI; 846, 900, 1332.

**Jamaica:** 550, 560, 580, 700, 720, 750.

**Japan:** NHK network; 747, 774, 1314.

**Mexico:** XEWA-540, XEX-730, XEW-900, XEQ-940, many others.

**Morocco:** RTM network; 171, 207, 612, 711, 1044.

**Netherlands:** Radio 10 Gold - 675, Flevoland - 747, Talk Radio - 1395.

**Norway:** NRK Kvitsoy - 1314.

**Saudi Arabia:** BSKSA; 594, 1512, 1521.

**South Korea:** 1305, 1566.

**Spain:** RNE; 585, 684, 855, COPE network; 837, 1053, 1143, SER network; 1044, 1575, others.

### High Tech Tower Hunting

U.R. Albrecht sent in photos of WNFL taken while on a trip to Green Bay, Wisconsin. "I'm always on the road looking for tower sites, and my favorites are the directional array type. These three self-standing towers belong to WNFL

AM Radio 1440 (5000 watts), and are located off Bellevue Street, just southeast of Green Bay." Unlike the old days when we had to do some hunting by direction finding with portable receivers, Albrecht uses services available on the Internet to locate tower sites. Transmitter site coordinates and detailed information including day/night power and phase angles for directional patterns are available through the Elliot Broadcast Services search engine at <<http://www.radiostation.com>>. Then via a link to Tiger Map Service at <<http://tiger.census.gov>>, the transmitter site is pinpointed on a street map. Once linked to Tiger Map, the transmitter site map can be customized to include highway markers, streets, and land features, and can be zoomed in or out to get as much detail as is necessary to find the site.

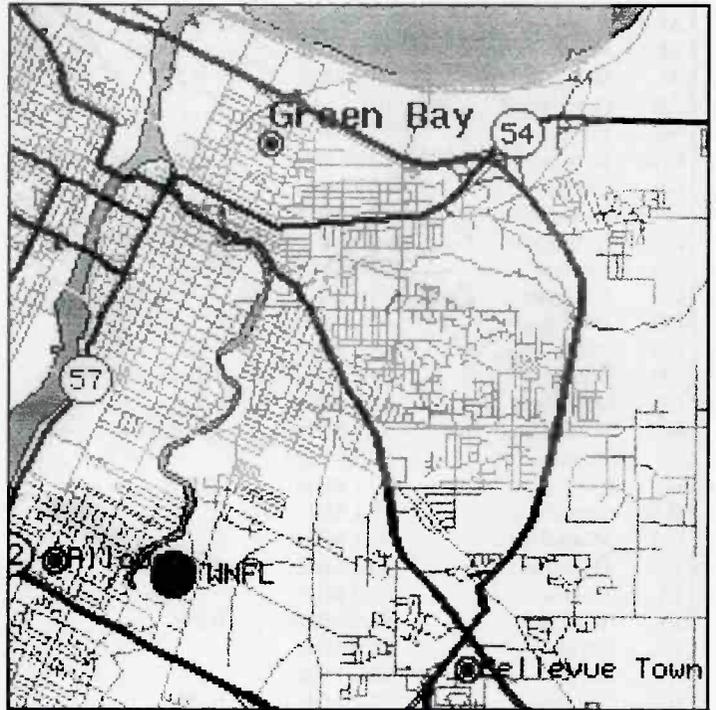
### On The Road Again

Motorists tired of the traffic problems at the new Source Mall in Westbury, Long Island, NY may soon get some relief in the form of Highway Advisory Radio. Business owner Alan Fortunoff hopes to



The WNFL 1360 kHz three-tower directional array. (Photo by U.R. Albrecht)

Location of WNFL using Tiger Map Service on the Internet. ↓



have Radio Fortunoff on the air by summer. Businesses and the Metropolitan Suburban Bus Authority have applied to the FCC for a license to provide 24-hour traffic reports on AM radio. Radio Fortunoff will have spotters on the major highways and store rooftops, and provide an 800 number for motorists to report traffic problems.

If you're often on the road, but don't want to miss your favorite radio programs, William Hutchings has released a completely revised and updated edition of "Radio on the Road: The Traveler's Companion." The revised edition even includes new information on talk and sports programs, so you'll always know when and where to tune in Rush Limbaugh or your favorite baseball teams. *Radio on the Road* is published by Arrowhead Publications.

### X-Band Files

Argentina is now being widely heard across North America on 1620 kilohertz, the first broadcaster from South America to appear on the expanded band. And

WCMQ Miami Springs, Florida on 1700 kilohertz has been heard from as far away as New Zealand, despite a Cuban jammer on the frequency. WCMQ is an easy catch here in the states. Gary Jackson reports no problem hearing WCMQ from Sacramento, California. Keep an ear to the expanded broadcast band as more stations sign on the air, providing for some unique catches before the band becomes too crowded.

### Digital Ready

WNQM Nashville, Tennessee, at 1300 kilohertz and sister station of shortwave's WWCR World-Wide Christian Radio, reports installation of a new 50,000 watt state-of-the-art AM transmitter, with the former 10,000 watt transmitter connected to the system as back-up. From General Manager George McClintock, "WNQM chose the Harris Corporation's DX 50, Digital Solid State AM Transmitter. This transmitter combines two leading technologies - digital and solid state - for a level of reliability and on air sound unsurpassed in any 50,000

watt AM transmitter. 1300 has been on the air continuously since 1947. WNQM airs 24 hours a day over 100 different churches, teachers, and ministries based both in middle Tennessee and other parts of the United States. At 6:30 p.m. to midnight, Monday through Friday, host Eliud Trevino presents the best in Hispanic music. Now in its third year, Radio Melodias offers a wide variety of music, plus news, weather, and special guests."

### More Radio News/Talk

After 70 years as an NBC affiliate, WSM Nashville 650 AM has switched to ABC. Sister station WWTN FM also made the switch from NBC's Mutual Radio Network to ABC. WSM signed on in 1925 as the station of National Life & Accident Insurance (the call letters stood for "We Shield Millions"), and was one of the earliest affiliates of the NBC radio network. Paul Harvey, the ABC news commentator famous for his "The Rest of the Story" reports, is said to be excited about the switch, having always wanted to be on WSM.

## Applied for Permit to Construct New AM Station

HI Honolulu 1130 kHz 10/6 kW

## Applied for Permits to Construct New FM Stations

AL	Hueytown	88.1 MHz	
AL	Marshalltown	88.7 MHz	
AL	Northport	88.1 MHz	
AR	Greenwood	101.5 MHz	
AZ	Parker	93.9 MHz	
CA	Berkeley	102.9 MHz	(KBLX-FM booster)
CA	Bishop	88.5 MHz	900 watts
CA	Redwood Valley	88.1 MHz	
CA	Ridgecrest	91.9 MHz	7.5 kW
CA	Truckee	101.5 MHz	
CO	Dolores	93.3 MHz	
CO	Durango	105.3 MHz	
CO	Montrose	88.3 MHz	5 kW
CO	Pueblo	89.9 MHz	870 watts
CO	Steamboat Spgs.	98.9 MHz	
DC	Washington	87.9 MHz	(Exp. DAB)
FL	Marathon	89.3 MHz	
FL	Quincy	90.1 MHz	20 kW
GA	Dawson	98.1 MHz	
GA	Montezuma	95.1 MHz	
IA	Dubuque	90.1 MHz	810 watts
IA	Marion	89.9 MHz	1.25 kW
IA	Waverly	88.9 MHz	6 kW
ID	Orofino	98.5 MHz	
ID	Parma	90.9 MHz	
IL	Duquoin	90.1 MHz	6 kW
IL	Geneso	88.1 MHz	2 kW
IL	Lexington	99.5 MHz	
IL	Taylorville	88.9 MHz	2 kW
IN	Hardinsburg	98.7 MHz	
IN	Wakarusa	89.9 MHz	
KS	Bronson	88.3 MHz	
KS	Great Bend	89.7 MHz	250 watts
KS	Riley	96.3 MHz	
KS	Winfield	91.9 MHz	250 watts
LA	DeRidder	91.1 MHz	250 watts
MD	Snow Hill	101.1 MHz	
MI	Harrisville	89.7 MHz	
MI	Imlay City	88.1 MHz	5.4 kW
MI	Manistique	99.9 MHz	
MN	Deer River	105.5 MHz	100 kW
MN	Mahnomen	101.5 MHz	
MO	Macon	99.9 MHz	
MO	Perryville	89.1 MHz	
MS	Liberty	107.7 MHz	
MT	Great Falls	90.7 MHz	
MT	Superior	107.5 MHz	
NC	Raeford	88.7 MHz	
NC	Scotts Hill	88.3 MHz	
ND	Bismarck	91.5 MHz	
ND	Hope	104.7 MHz	
NE	Imperial	102.9 MHz	
NJ	Cape May C.H.	88.1 MHz	550 watts
NM	Kirkland	102.9 MHz	100 kW
NV	Beatty	100.3 MHz	
NY	Lyon Mtn.	89.7 MHz	190 watts
OH	Canton	90.1 MHz	
OH	Portsmouth	107.5 MHz	

OH	Rushville	88.5 MHz	1 kW
OK	Kingfisher	103.5 MHz	
OK	Polola	88.1 MHz	
OR	Bend	99.7 MHz	
OR	Sisters	89.3 MHz	
PA	Ohio Pyle	89.1 MHz	
SD	Rapid City	88.3 MHz	
TX	Big Spring	89.3 MHz	3 kW
TX	Bridgeport	90.5 MHz	
TX	Brownfield	88.5 MHz	
TX	Brownwood	89.3 MHz	
TX	Freer	90.7 MHz	
TX	Levelland	91.9 MHz	
TX	Paris	89.3 MHz	6 kW
TX	Plainview	88.5 MHz	
TX	Temple	88.5 MHz	250 watts
TX	Thorndale	99.3 MHz	
TX	Victoria	91.5 MHz	4.1 kW
UT	Huntsville	103.1 MHz	
UT	Weston	95.9 MHz	
VA	Chincoteague	96.5 MHz	
VA	Emporia	89.3 MHz	
WA	Clarkston	88.1 MHz	
WI	Wentworth	88.5 MHz	
WY	Buffalo	90.5 MHz	
WY	Flendo	100.1 MHz	
WY	Midwest	107.9 MHz	

## Granted Permits to Construct New FM Stations

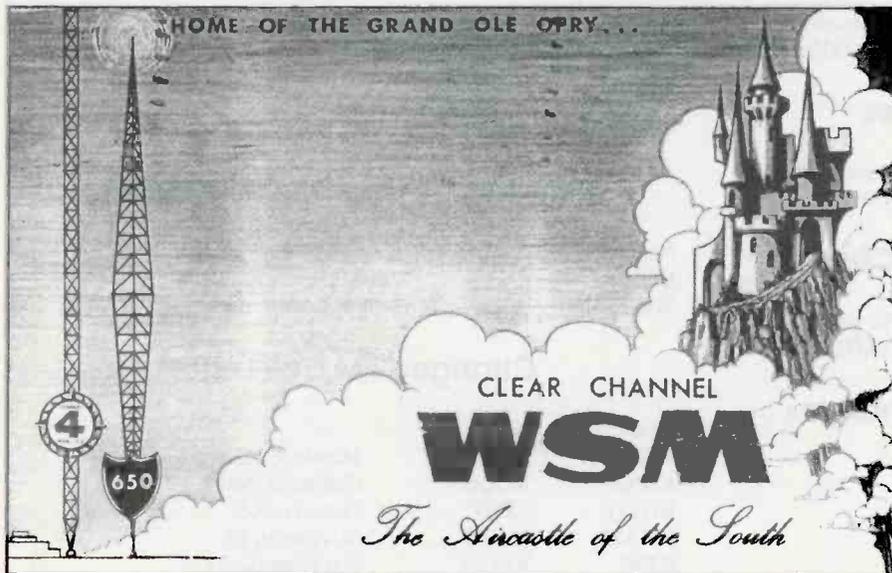
GA	Mableton	102.5 MHz	3 kW
IL	Tower Hill	98.3 MHz	2.89 kW
MA	Woods Hole	90.1 MHz	8 kW
MN	Grand Marais	90.7 MHz	25 kW
MN	Starbuck	97.3 MHz	50 kW
MO	Warsaw	98.5 MHz	3 kW
NC	Atlantic Beach	91.5 MHz	26 kW
ND	Fargo	88.7 MHz	
VA	Wise	90.5 MHz	
WY	Albin	107.3 MHz	

## Cancelled

KBYG-FM	Coahoma, TX	105.5 MHz	6 kW
WADW	Pickford, MI	105.5 MHz	6 kW
WXVU-1	Villanova, PA	89.1 MHz	(booster)

## Requesting Changed AM Facilities

KELY	Ely, NV	1230 kHz	Seeks to change power
KEYH	Houston, TX	850 kHz	Seeks to add 185 watt night ops
KGHF	Pueblo, CO	1350 kHz	Seeks to change power
WAKM	Franklin, TN	950 kHz	Seeks day increase to 2.5 kW
WCHB	Taylor, MI	1200 kHz	Seeks night increase to 15 kW
WVSR	Charleston, WV	1240 kHz	Seeks to change community
WWLS	Moore, OK	640 kHz	Seeks day increase to 5 kW
WWWE	Carrollton, GA	1100 kHz	Seeks move to Hapeville, 5 kW



WSM 650 kHz in Nashville, TN is now an ABC affiliate.

The Cable Satellite Public Affairs Network (C-SPAN) is planning to start a radio network, beginning with the purchase of WDCU 90.1 FM from the University of Washington in Washington, DC. The call letters are now WCSP, and the station carries audio from the cable TV network. C-SPAN hopes to establish sim-

ilar stations in other cities and begin carrying regional and local coverage of state legislative sessions and local city council meetings.

A recently announced merger between CBS/Westinghouse and American Radio Systems (ARS) has become rather complicated for Boston, Massachusetts radio

stations. CBS was at the FCC local ownership limit in Boston before the ARS deal, owning WBZ-1030 and TV 4, WZLX-100.7, WODS-103.3, and WBCN-104.1. Boston-based ARS holds WRKO-680, WEEI-850, WEGQ-93.7, WBMX-98.5, and WAAF-107.3. The deal will give CBS ownership in the top 20 largest markets across the U.S. Add Greater Media to the mix, expressing interest in the purchase of WEEI and WRKO. Greater Media is at the FCC limit for FMs with WBOS-92.9, WSJZ-96.9, WKLB-99.5, WROR-105.7, and WMJX-106.7, and would like to expand into AM. One thing's for sure, plenty of money will change hands in Boston and elsewhere as the merger frenzy continues, resulting from the 1996 FCC deregulation.

### Fire Ruled Accidental

Initial news reports that a fire that destroyed controversial radio station KHNC Johnstown, Colorado might have been arson were quickly snuffed out as it was ruled accidental by fire officials. The fire was determined to have been started by a hot-plate that was left unattended. KHNC, known as Patriot Radio, broad-

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CIRCLE 68 ON READER SERVICE CARD

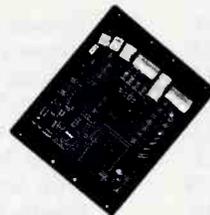
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CIRCLE 74 ON READER SERVICE CARD

WXIT Blowing Rock, NC 1500 kHz Seeks shift to 1200 kHz, 10 kW

WHGB Murrell's Inlet, SC  
 WKQS-FM Negaunee, MI  
 WMFL Florida City, FL  
 WMKL Key Largo, FL  
 WWWD Punta Rassa, FL

### Changed AM Facilities

WBZT W. Palm Beach, FL 1290 kHz Changed power to 10/4.9 kW

### Pending FM Call Letter Changes

#### Requesting FM Frequency Change

KRVH Rio Vista, CA 90.9 MHz Seeks shift to 89.7 MHz, 200 watts

New Old  
 KOZN KYYS Kansas City, KS  
 WKPO WMJB Evansville, WI

#### Pending AM Call Letter Changes

New	Old	
KCTD	KXMG	Los Angeles, CA
KLDS	KPSO	Falfurrias, TX
KMRI	KRGO	W. Valley City, UT
WHYT	WIFN	Marine City, MI

#### Changed FM Call Letters

New	Old	
KARZ	KBJJ	Marshall, MN
KBXR	KOQL	Columbia, MO
KGLQ	KHTC	Phoenix, AZ
KHAM	KAWN	St. Ansgar, IA
KISQ	KBGG	San Francisco, CA
KISV	KERN-FM	Bakersfield, CA
KJBX	KCCN	Trumann, AR
KKBE	KTND	Ojai, CA
KKNG-FM	KKNG	Holdenville, OK
KKTL	KRTK	Cleveland, TX
KNKK	KWAZ	Needles, CA
KOQL	KBXR	Ashland, MO
KPPT-FM	KZUS-FM	Toledo, OR
KXGG	KGGY	Dubuque, IA
KXME	KBLZ	Kaneohe, HI
KZDL	KLTR-FM	Terrell, TX
KZSN	KZSN-FM	Hutchinson, KS
WCSP-FM	WDCU	Washington, DC
WDIN	WCHQ-FM	Camuy, PR
WFXF	WKZW	Chillicothe, OH
WJKS	WNNN	Canton, NJ
WLSY	WRVI	New Albany, IN
WKLB-FM	WOAZ	Lowell, MA
WLBS	WAJH	Bristol, PA
WLNF	WLUN	Lumberton, MS
WMNG	WAQW	Christiansted, VI
WMXQ	WIVY-FM	Jacksonville, FL
WQSO	WSRI	Rochester, NH
WRBV	WRBG	Warner-Robins, GA
WRVI	WHITE	Valley Station, KY
WRVX	WGOL	Lynchburg, VA
WSFT	WLYC-FM	Williamsport, PA
WSGY	WVSC-FM	Somerset, PA
WUKQ	WKJB-FM	Mayaguez, PR
WUPP	WRCY	Warrenton, VA
WVMX	WWNK-FM	Cincinnati, OH
WXXM	WFLN-FM	Philadelphia, PA
WYYW	WZRW	Marion, MS
WYYX	WTBB	Bonifay, FL
WZNW	WRIR	Bethlehem, WV

#### Changed AM Call Letters

New	Old	
KGXL	KBTL	Costa Mesa, CA
KJQI	KBAI	Morro Bay, CA
KKNG	KRAF	Holdenville, OK
KMYR	KQAM	Wichita, KS
KOTK	KWJJ	Portland, OR
KPPT	KZUS	Toledo, OR
KQAM	KZSN	Wichita, KS
KSUH	KKBY	Puyallup, WA
WFRF	WANM	Tallahassee, FL
WJNA	WJNO	W. Palm Beach, FL
WJNO	WJNA	Boynton Beach, FL
WJWR	WXLX	Newark, NJ
WNNN	WJIC	Salem, NJ
WXXI	WETR	Winston-Salem, NC
WYUR	WDOZ	Dearborn, MI
WZDB	WEJM	Chicago, IL

#### New FM Call Letters Issued

KAUL	Ellington, MO
KAXF	Huntsville, TX
KAXG	Gillette, WY
KKRR	Casper, WY
KMLD	Casper, WY
KNLP	Potosi, MO
KRAW	Lake Arthur, LA
WAUQ	Charles City, VA
WAUT	Tullahoma, TN
WBCS	Dillwyn, VA
WFRI	Winamac, IN

casts conservative talk shows and Christian programs at 1360 kilohertz. KHNC is expected to return to the airwaves shortly if not already.

### Reader Mail

And from Harry Ellis, this update on old

time radio in reference to the Broadcast DXing column in the December '97 issue of *Pop'Comm*, "Your listings of old time radio rebroadcasts missed a major one. Every Saturday afternoon, from 1 to 5 p.m. Central time, WNIB Chicago 97.1 and its repeater WNIZ Zion 96.9 broadcast "Those Were The Days." It's hosted by

John Schaden and comes from the Museum of Broadcast Communication now working out of the old library downtown (Chicago)."

Thanks to U.R. Albrecht, Nancy Barry, Jill Dybka, Harry Ellis, Bob Gilbert, Gary Jackson, Paul Smith, Edwin Tulowitzki, and Elmer Walleesen. Until next time, 73!

# Product Spotlight

POP'COMM REVIEWS PRODUCTS OF INTEREST

## ICOM PCR-1000 - Black Box Computer-Controlled Radio

They showed it at Dayton, and it looked quite impressive! Then it appeared on their Web site, and taunted us a bit more. This newest communications receiver from ICOM is nothing more than a black box with a speaker and computer connection. But what a black box!

Actually, it has a few more connections too. The rear panel has a computer DB-9 connector for any RS-232 port, an audio out jack if you'd like to feed the audio into another speaker, or perhaps back into your computer's sound system, a BNC antenna connection and a jack for a packet controller. Cool. And power - 12 Vdc makes it so very easy to power from your car or other portable source if you wish to take the unit on the road. The only control on the front panel is "power."

As a receiver, it's pretty much what you'd expect from ICOM; 50 kHz to 1300 MHz (less cell, of course in the good ol' USA). You can tell just from picking up the little box that it's built solid. Sensitivity and selectivity are good, although I did experience some slight overloading in the VHF/UHF range, the unit is certainly as good as or better than most scanners on the market.

The first question that always gets asked about a receiver like this is "what about noise from the computer?" Well, I'm happy to report that because the receiver is isolated from the computer (the radio is what's in the black box) there is much less opportunity for noise to enter the system, and if it does, you have some control. I experienced some noise on the HF bands, but after rerouting an antenna wire away from the computer and monitor, it died down considerably. I'm sure that most of it could probably be removed with some careful planning and shielded antenna leads, which I did not have access to in testing the HF ranges.

Software is the other part of the equation here. This is truly a black box radio that becomes a computer peripheral. The recommended system requirements are a bit steep; 486/DX4/100 or better, Windows 3.1 or 95. 16MB of RAM and



*The PCR-1000 is considerably smaller than a laptop. If you already carry a laptop with you, it should make a great travel radio for both the shortwave listener and scanner enthusiast combined.*

10MB of hard disk space, and a serial port capable of 38400bps or better.

The first thing I did when I received the unit (and quit drooling over the box) was to install it with my laptop computer, since that's the only one I had with me at work. (Sure hope the boss doesn't subscribe to *Pop'Comm*.) The software features an installer, and went in quickly.

As a scanner, the software leaves a bit to be desired. Just like the communications receivers that have come before it, the PCR-1000 does not lend itself well to scanning in the traditional sense. It has 25 banks of 50 channels each (and you can have as many of these collections as you care to save on your hard disk). But you can only scan one bank at a time. There are the usual options for skipping a memory, mode scan (scan all the USB channels, for instance) and selected memory scan that are typical ICOM. But only one bank at a time. The good news is that this is entirely a software issue and could be fixed quickly at any time by ICOM, or by any third party that chooses to write software for it. Even emulating the bank/no-bank controls on the

R9000 would be convenient for those who wish to use the unit as a scanner.

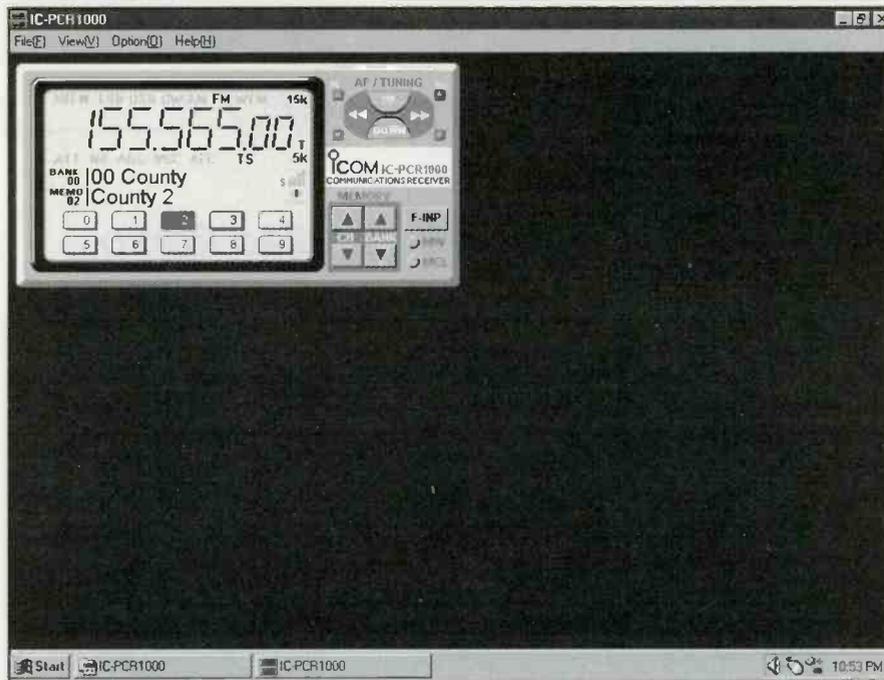
The other major inconvenience for scanning is that while you can have a delay on all channels, or opt for no delay, you can't delay two seconds on channel one, and none on channel 2 like you can do with many basic scanners. The bad news is that ICOM is not releasing the protocol for developers at this time. The good news is that all of these problems could be addressed in software at any time.

As a shortwave receiver, the PCR-1000 is fairly impressive. Since in shortwave operation we don't do a lot of scanning or other things that hinder the operation of the receiver as a scanner, those features aren't missed. With a suitable antenna, the PCR-1000 makes an excellent SW receiver on par with some of the portatops and similar units in the price range. There is a software "dial" that allows tuning up

---

*"You can tell just from picking up the little box that it's built solid."*

---



The "Radio" mode provides for a simple, yet effective control especially for shortwave program listening, monitoring a single frequency, or jumping around in memories.

and down the bands quite easily. It would be nice if there were a couple of other filter choices, but there aren't. Quite frankly, I have to keep reminding myself that this is a \$600 receiver and not a \$2000 or more communications receiver that would be expected to have these features.

## Data Entry

Getting the frequencies in the software also could use a little work; there is a manual mode in each of the receiver screens where you enter a frequency and then write it to memory just like you would on the radio. But since we're computer-controlled here, it makes sense that there would be another way to get the data in. Well there is, although not nearly as complete as I would hope. There are no import/export functions for the "worksheet" which memories are entered into. There are also places where a double-click of the mouse is required to change a field when it seems like a single click would do the trick. Once again, I'm confident that these issues will be addressed over time. Also, don't construe that it's hard to get the information into - quite the contrary. It's much easier to get data into this program than it is to program a typical receiver.

The first step is to select the memory worksheet. At the top of the window is the bank selector - and you can choose any of the 20 banks. You can also choose

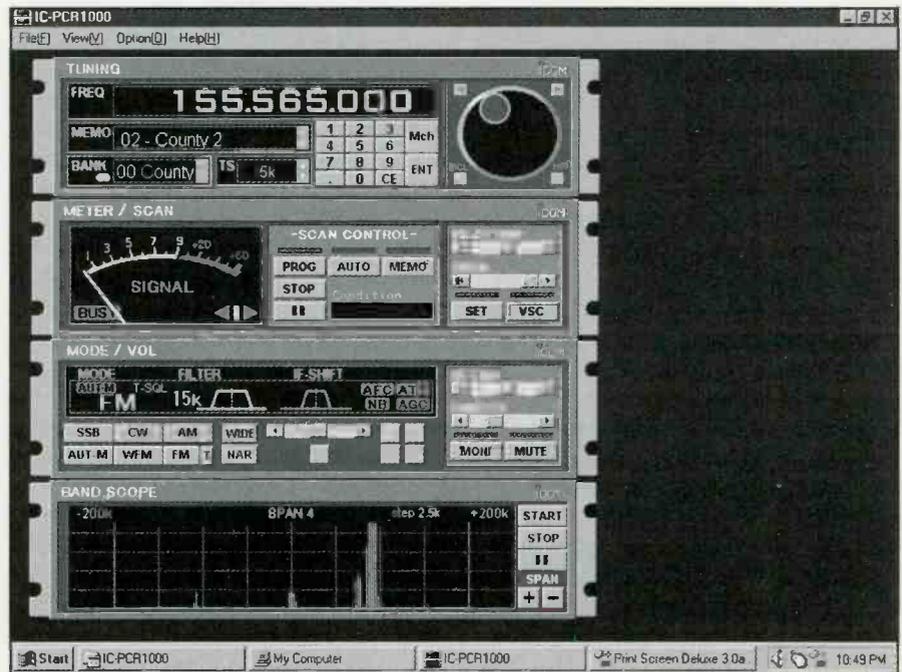
to open another file from the file menu, so there's not much limitation on capacity. Once the bank is set, the worksheet shows channels down the left side running from 00 to 49.

Following that is the name of the channel (any alpha characters up to 32 can be

entered). The next column is frequency, but here's one of the places where the user interface could use a little work. When you click-on a line of the worksheet, the entire line highlights. Then, if you click again, no matter where you click, the Frequency is the cell that becomes active, because you can not enter other data without a frequency. However, as far as I can tell, you cannot move from cell to cell effectively with the keyboard. It is possible, using a combination of arrow keys and enter to get there, but it is a confusing process that seems to be way more work than necessary. It seems like the tab key that is supported in most other windows applications would be a perfect way to do this.

Once the frequency is entered, then the other information can be filled in, if it doesn't default for you. Things like Mode, Filter and Step all fill in based on preprogrammed defaults. The attenuator and tone squelch default to off, but can be changed with a few clicks. You can also set if the memory is to be skipped, or is included in the "Sel"ected memory scan.

One of the great surprises with the PCR-1000 is the inclusion of CTCSS or tone squelch. Several of the high end scanners are starting to include this feature, and it really helps reduce interference. To my knowledge, this is a first from ICOM... let's hope we see more!



The communications receiver view provides full functionality while maintaining an interface that most of us would be very comfortable using. It was easy to figure out the controls on this one without reading the manual or the help screens (which are very good).

## Three, Three, Three Receivers In One!

One of the first things that most people notice after the flashy graphics is that the PCR-1000, actually has 3 modes of operation that really do change the personality and user interface of the receiver. The easiest to use mode is the "Radio" view. This simulates a small portable SW receiver or scanner control panel. It has all the necessary controls to operate the receiver (when combined with the memory worksheet, which is available at any time). This mode takes very little room on the screen, and is great for casual listening to SW programs, or while you are working on something else and want to have the radio running. This mode does not have any scan controls available, but I did use it for listening to a single VHF channel quite effectively.

The next mode is the "communications receiver" which looks pretty much like some of the front panels from other top-of-the-line ICOM receivers. In fact, it reminds me of a cross between the R-9000 and the newer 8500. There is a spectrum display at the bottom of the radio, and most of the buttons you'd expect to

find on a real communications receiver are here, except handled in software. One interesting feature is that the tuning knobs and other "rotary" controls are accessed with the mouse. Pushing the left mouse button rotates them counter clockwise and the right mouse button rotates them clockwise. The control that is affected is the one the pointer is over, so it's fairly easy to operate. You can enter frequencies manually and save them to memory from this view if you'd prefer not to use the worksheet.

The last view is the component screen, and the one that I have spent most of my time using. In this view, all of the controls are fully accessible, and a lot of choices are presented. It is possible to turn on and off each of the four major "panels" that make up this view, so you can customize how much information, and how much screen space, is presented.

The first panel is the Tuning panel. Here, all of the frequency display information, memory bank and alpha displays and the tuning knob are located. It would be possible to operate some functions of the receiver without this panel showing, but it would be difficult at best. When I'm letting the receiver run in the background while I work on other things, I frequent-

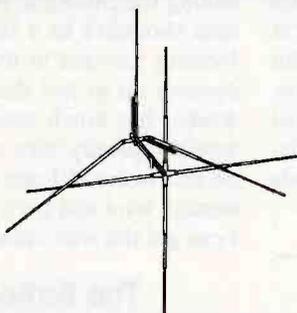
ly have just the tuning panel turned on so I can watch what the receiver is doing.

The next panel is the meter/scan panel. The meter part is obvious, and it's one of the coolest implementations of a signal strength meter I have ever seen in software. It looks just like a real ICOM receiver meter with the analog pointer. And it's big enough that you can see it from across the room. Also located on this panel are all of the scan setup and selection controls.

Next comes the cool part. The spectrum display panel. For shortwave listening, this is a really handy feature as it shows at a glance what is up and down the band. Unfortunately, it has a limit of 200 kHz from center, so it is not terribly useful in the VHF/UHF mode, although it is interesting to watch. There is enough span there to tell about nearby signals that could be causing interference, so it is a useful feature in addition to the "coolness" feature.

And finally, the mode/volume panel. This panel is pretty important for getting things set up, although once running, it is not necessary all the time. The squelch and volume controls are both on this one, so it is handy to keep it available if you have screen space.

### "Small in Size, Large in Performance" The "Smokin' Gunn II" two element directional beam.



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# Delta Research



Box 13677 - Wauwatosa, WI 53213 - FAX/Phone (414) 353-4567

## Pop'Comm P.O. (from page 6)

get on a pair of skis because I have two right feet and would probably get lost coming down the mountain, but the fact is that today many folks are content to ski the intermediate slopes without ever being forced to learn how snow-making machines really work or learning how to rub two sticks together for fire should they get stranded on the mountain after dark. In 1997, as we approach the turn of the century, if my life gets to the point where I've got to radio for help using CW that "will make it through when all others fail" then it's probably better that everyone send flowers to my wife 'cause 'ol Uncle Harold just bought the farm!

### Freeband Amuses Paul

#### Dear Editor:

I've been a big fan of *Pop'Comm* for many years, but have never written in like this. I'm really amused at the freeband topic which comes up over and over again with such differing opinions. Well, I have operated there for years and know one thing: Not many of these individuals are Cbers! That seems to be the stereotype, but is far from the truth. Many "upper class" hams operate there regularly to get away from the rudeness and so-called elitist attitude that seems to be rampant on the ham bands. I do however, hear some "goodbuddy" types gracing the airwaves from time to time, but on the other hand just the other night I heard an echo mic on 80 meters! How 'bout that? It is funny though whenever a discussion comes up about "freebands" or "out of banders" they are quickly labeled as Cbers. There are many long-time hams using these frequencies, not only on 11 meters, but also in and around the 45 meter band.

If you ever take the time to listen you will be surprised how many of these people operate very professionally and have a certain degree of technical expertise! So forget the stereotype that the operator has to be a Cber if he's out of band. After all, I'm not a Cber. *Pop'Comm*—thanks for a super magazine!

Paul R.  
Spartanburg, SC



*This is the cool one: the "Components" view allows you to select all kinds of configurations and get access to all the controls the PCR-1000 offers. The order of the components can be rearranged too.*

There is one more panel available that is hidden in the menu. The DTMF Remote panel. This panel allows you to do two things. One is to display any DTMF (tones) that might be received. The second is to remote control the computer to some extent. There are five "codes" that you can assign to certain tasks. The most powerful of which is running another program when the tone is received. I'm not exactly sure of the applications for this for the typical scanner or shortwave enthusiast, but it is there. You can also play a .wav file or have the program display a message on the screen that the code number was received.

---

***"I know I'll be adding one to my shack."***

---

Speaking of screen space, it is pretty easy to fill up the entire screen of the computer with nothing but the components of the software. That works great if you are not trying to use the computer for anything else. However, since the requirements of the software are fairly healthy, it's likely that the PCR-1000 will be installed on the "main computer" and you'll want to be doing other things while the radio is running. Of course, in single-channel receive mode, and even scanning, this really isn't a problem. It would

be neat to see a DOS program or something that required a bit less of a processor so it would be practical to dedicate an older computer to the receiver.

However, ICOM appears to be marketing this as a traveling radio, and there is where it will do a great job. I already carry a laptop with me when I travel, and adding the cable and receiver box to my case shouldn't be a big deal. I'm really looking forward to the first trip I have coming up to test this theory out. If it works, it's much more receiver that I would typically take along, particularly on shortwave if I can remember to take enough wire and get a hotel room where I can get the wire outside.

### The Bottom Line

This makes an excellent second radio for almost anyone who has the computer to run the software. While it would be nice to see some enhancements in software, or third party software development, the existing system is very usable both for scanning and shortwave listeners. While I may not recommend it to any serious radio enthusiast as a primary receiver, it may serve to get some of my computer friends interested in radio. And there has been a fair bit of interest amongst the radio-afflicted as a second receiver. Check it out. I know I'll be adding one to my shack! ■

# The Pirate's Den

BY EDWARD TEACH

FOCUS ON FREE RADIO BROADCASTING

## Hot On the Trail of Tons of Pirate Loggings!

**W**e've got another huge pile of logs this month for which I express an equally large "thank you!" Now comes the problem of trying to fit as much in as I can!

**Radio Nonsense, 6955** at 0227 with Monkees music. (David Gale, NC)

**WLIS, 6955** at 0030 with DJ "Jack." "Serving NE Allegheny county since 1990." (Gale, NC)

**Radio Eclipse, 6955** at 2045 with DJ Steve Mann. (Gale, NC) 0144 sign on with season finale. (William R. Wilkins, MO) **6955 USB** 2130 to 2200 with various spoof items. (Dean Burgess, MA) Then heard at 2120 offering special QSL. (Joe Wood, SC)

**Radio USA, 6955** at 0040 with web site info and pirate news. (Gale, NC) **6956** at 0022 and **6955 USB** at 0120 with Mr. Blue Sky. (Wilkins, MO) 2030 with letters, Belfast address. Off 2042. (Dave Jeffery, NY)

**One Voice Radio, 6955** at 2345 discussing vitamins, nursing, cancer and other health issues. (Gale, NC)

**KRAP, 6955** to 0333 close with Fred Flintstone and oldies. (Wilkins, MO)

**Laser Hot Hits, 6955 USB** to 2152 sign-off with English-accented announcer. (Wilkins, MO)

**Radio Airplane, 6954.8 USB** at 2152 sign on to 2232 close. "Radio America broadcasting from the free skies over North America." Said 100 watts. Reports to ACE. (Wilkins, MO)

**Up Against the Wall Radio, 6955 USB** 2249 on to 2333 off. Said not to bother with a report unless program comments are included. (Wilkins, MO)

**Radio Our World** (NAPRS relay) **6955** at 1618 with ID and NAPRS ID before close at 1630. (Jeffery, NY)

**WREC - Radio Free East Coast, 6955** at 2300 with humor, ID, Belfast address. (Jeffery, NY) **6955 USB** at 2016 "broadcasting to North America, Canada and Europe with 100 watts of power." (Ernest P. Maletto, PA) 2120 with announcer P.J. Sparx. (Wood, SC)

**Radio Metallica Worldwide, 6955** at 0103 with rock, '40s music, Blue Ridge address. (Jeffery, NY) 0317 to 0405 close.

Other days at 0100 and 0105. (Eric Miller, CA)

**WRAY, 6955** at 2314 with rock, ID, Wellsville address. (Jeffery, NY)

**Cat In the Hat Radio, 6955 USB** at 1945 with Dr. Seuss stories and Providence, RI address. (Burgess, MA) 2148 with children's songs. Also at 1920 (William T. Hassig, IL)

**He Man Radio, 6955 USB** at 0055. Said had been active for seven years. Also heard at 2136 with T-shirt commercial. Hassig, IL)

**TGIF (?), 6955 USB** at 0129 with rock montage. (Hassig, IL)

**Radio Atlantica, 6955 USB** at 2248, "testing - this is grandpa on Radio Atlantica." (Hassig, IL)

**Take It Easy Radio, 6955 USB** at 0015 with blues-rock, country rock, comedy. (Hassig, IL) 0633 to 0652 close. Gave Belfast address and stressed the need for complete reports and three stamps. (Max Foust, IN)

**WMPR, 6955.35** at 2222 signing on with tune by Enya. Possible relay by Metallica. (Hassig, IL)

**RFM, 6955 USB** at 2336 with funny commercials, rock. (Hassig, IL)

**Radio Azteca, 6955** at 2153 with Bram Stoker. (Wood, SC)

**Voice of the Long Run/Radio Eclipse, 6955** at 1832 including season premier of Radio Eclipse. Also at 1701, 2115. (Lee Silvi, OH)

**Real Alternative Radio, 6955** at 2017 via Radio Eclipse relay. Gave the Blue Ridge Summit mail drop. (Silvi, OH)

**Radio Eurogeek, 6955 USB** heard at 2217 with a rebroadcast of St. Helena. (Silvi, OH)

**WARR, 6955 USB** at 0101. (Silvi, OH)

**Friday Radio, 6955** at 0240 with celebration of Friday and the weekend. (Silvi, OH)

**WHAM** (tentative call ID), **6955 USB** at 2350. Station ended the broadcast with music, ID and a mention of the Internet. (Silvi, OH)

**WFMQ, 6955 USB** at 1636 with usual music and ID format. (Silvi, OH)

**WSSR - Solid Rock Radio, 6955 USB**, at 1854 with listener's letters and

FREE RADIO STATION

DR. T.

RADIO METALLICA WORLDWIDE

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10,000 WATTS OF PURE AWESOME AUDIO POWER

*Radio Metallica continues to be one of the most widely heard pirate stations of all time. Thanks to William Flagel in Michigan for a copy of their QSL.*

comedy routine. (Jerry Coatsworth, ON)

**WPN, 6955 USB**, at 1953 with mention of the Huntsville drop and Night Rider music. (Coatsworth, ON)

**Pirate Radio Boston, 6955** at 2232 with reggae, letters. (Coatsworth, ON)

**Take It to the Limit Radio, 6955 USB** at 2325. Announcer was Don Pardo. (Coatsworth, ON)

**WQSL, 6955** at 1455 to 1528 close. Music and many loud and clear IDs. (Coatsworth, ON)

**Voice of Shortwave Radio, 6955 USB** at 1755 starting with "Candle in the Wind." Gave the Blue Ridge address. (Coatsworth, ON)

**Lounge Lizard Radio, 6955 USB** at 0523 with Hunsicker Lounge Program. (Coatsworth, ON)

**Hotel California, 6955 USB** at 1827 with a one minute 20 second tape loop played several times. Eagle music. (Coatsworth, ON)

**Mystery Radio, 6955 USB** at 0050 with instrumental version of "Fields of Gold." Laughter heard at sign-off. (Coatsworth, ON)

Richard Parly in British Columbia informs us that the station "**Rocket 99**" mentioned here a few months ago is actually "Brockett 99" - a 60-minute tape about a fictitious FM station located on an Indian reserve near Pincher Creek in southwestern Alberta. Brockett is located in Pincher Creek. Thanks Richard for the clarification!

We're out of space. Keep on pirate chasin' while the getting continues to be so good and be sure to keep those great logs headed this way! ■

# Communications Confidential

YOUR GUIDE TO SHORTWAVE "UTILITY" STATIONS

## Things Are Not Always As They Seem . . .

The world of utility station listening is much like the world of magic. Indeed things are not always what they seem. Because a 120 character Emergency Action Message (EAM) is broadcast on a USAF/GHFS frequency, it doesn't mean it's time to head for the bomb shelter or that the EAM is even necessarily related to world events going on. It may be, as in magic, a little hocus-pocus. Or maybe not. Military callsigns can be duplicated. SHARK aircraft heard on the GHFS channels are most often USAF 24th Wing, Air Combat Command aircraft based at Howard AFB in Panama. These include (most often) the C-27A 'Spartan' short take off & landing (STOL) aircraft operated by the U.S. Southern Command (SOUTHCOM), C-21, C-130, and CT-43 aircraft.

SHARK is also used by the U.S. Coast Guard by cutters involved in drug interdiction, using the last two or three digits of the hull number. SHARK has also been used by at least one Air National Guard fighter squadron, and probably has other users as well. Fisherman perhaps a tad into a restricted area or past the end of a season, can sound a lot like drug dealers plotting their way in by sea.

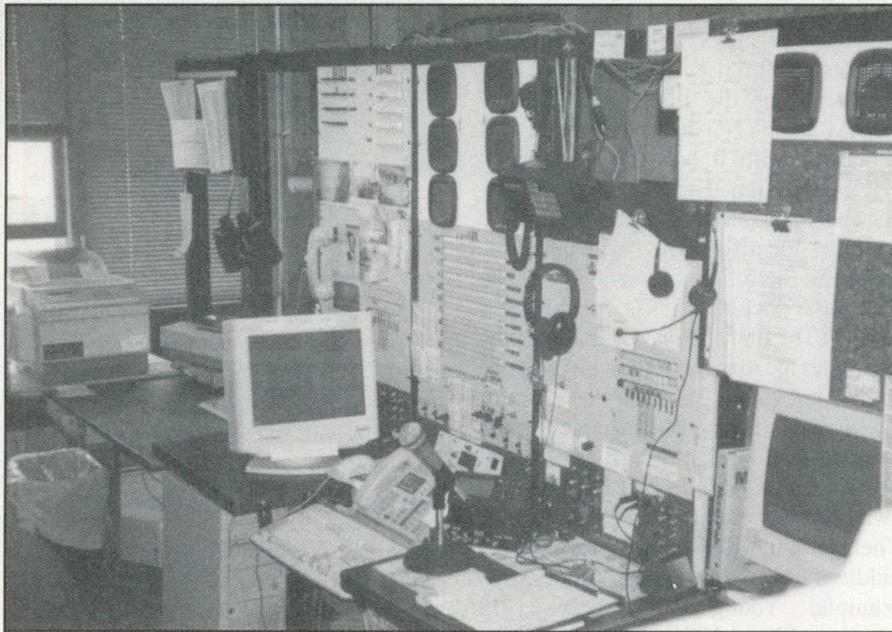
In the digital end of the hobby, things are usually a little clearer but not always. Take the case of all the reports of PNA Manila sending news in SITOR-B/FEC on such frequencies as 4205.5; 6301.5, 6309.0, 12560 to 12569.0; 16797 to 16803.0; and 18800.0 kHz. amongst others. The first clue lies in the fact that these stations are logged day and night at times when there would be no probable propagation from the Philippines. Secondly, these are all in the maritime non-paired digital/CW bands. For many years I also logged these as "PNA Manila" based on reference books listing them on or near these frequencies. But after pondering some clues (like Manila coming into Ohio almost 24 hours a day on various bands -hi!) I later discovered via a ships QSL that this is an extensive network of Filipino-crewed ships relaying news from the Philippines taken off the DZJ, Bulacan Radio, satellite transmission. In



*Photo taken by Joe Olig of the WLC Rogers City Radio facility showing some of the stations radio towers.*

this manner smaller ships not having satellite comms can get the news from home. On several occasions since I have seen the ships, who use coded ID's, accidentally activate their sitor log-in, revealing the selcall and log-in abbreviation (often the callsign) used by the ship. The same goes for logs in the same frequency ranges carrying the ID of "DSR Rostock," Germany or "Rugan Radio." These are in fact ships of the Deutsche Seereederei GmbH Rostock (DSR) line relaying news in German. They generally use their actual callsigns if you catch the broadcast from the start. I have logged "M/V Breman"; and DQFX, M/V DSR Asia (was DQFX, Choyang-Elite), with others logging in prior to the send. Another one which is often mislabeled as PTT Warsaw or MFA Warsaw, is the Polish maritime station SPW, Warsaw Radio. Although the originating station identifies as 'SPW,' their shore-to-ship traffic as well as the press send is actually relayed/transmitted on common old fixed frequencies assigned to old PTT Warsaw, which are all listed as SOx-### in official ITU listings. Formerly these fixed frequencies have been used by:

PTT Warsaw (point-to-point traffic, radiotelephone and RTTY/telex); PAP Warsaw, with news broadcasts in RTTY; Warsaw Radio, SPW, with news for ships in CW, RTTY and FEC; Warsaw Radio, SPW, for traffic to ships (radiotelephone and SITOR) with only the SPW activities remaining now. The old PTT callsigns are referenced at the start of the send. I recently caught them sending "VVV CQ CQ AT 1800 UTC SOL 242B/FEC/11423,5 SOV 22886,5 SOT265B/FEC/18648,5 SOO 291B/FEC/14912,5 AND SOH 297/FEC/7975 KHZ PX FOR SPMH AS PLS, VVV CQ CQ CQ AT 1400 UTC SOV 293B/FEC/20933,5 SOV 228B/FEC/20286,5 SOT 265B/FEC/18648,5 SOL 242B/FEC/11423,5 AND SOH 297/FEC/7975 KHZ PX FOR SPMH AS PLS +, VVV CQ CQ CQ AT 1800 UTC SOL 242B/FEC/11423,5 SOV 228B/FEC/20286,5 SOT 265B/FEC/18648,5 SOO 291B/FEC/14912,5 AND SOH 297/FEC/7975 KHZ PX FOR SPMH AS PLS +". The station then went into a traffic list, sent news, sports and currency exchanges signing off with DE SPW. The format of numbered news items, sports and currency exchange rates



View of the operations area of WLC (Photo by Joe Olig).

is very common amongst these stations. What I've learned over the years is to use reference books as a guide, no matter if it's a station or a callsign ID. This, added to information you heard or decoded, can result in a positive ID. But I would not use any ID out of a book or list blindly without some substantiation or confirmation.

In my example of "SHARK" above, if I heard SHARK 21 working MacDill GHFS for a phone patch to LOBO, the SOUTHCOM Air Operations Center, at Howard AFB (not to be confused with LOBO OPS, South Dakota Air National Guard Ops at Joe Foss Field, SD who fly F-16's), then it's probably a 24th Wing aircraft. If you hear it on a USCG, DEA, or Customs frequency, then I'd bet it was a cutter. I think you see the point now.

Last month I passed on the sad news about WLC, Rogers City Radio, in Michigan. Joe Olig, who had recently visited the station, passed on the information he had received from them. Apparently only one of about 18 U.S. and Canadian ship companies had agreed to a monthly fee adjustment that would have kept WLC on the air. Since then, calls to the station are unanswered and the station is off the air. Apparently the arrangement with Globe Wireless also fell through, sending the final nail in WLC's coffin.

## CW Gone From British MF Coast Stations

The UK Coast Guard no longer requires a 500 kHz distress watch to be kept effec-

tive December 31st. As a result all British MF coast radio stations have ceased all commercial operations in CW. Portishead Radio will continue to provide HF CW service. According to information released by the Canadian Coast Guard, VCK, Sept-Iles CG Radio, and VCN, Cap-aux-Meules (aka Grindstone) CG Radio, is scheduled to close down on March 31st, 1998. VCN will be remotely controlled by VCG, Riviere-au-Renard CG Radio.

## New Klingenfuss Products

Klingenfuss Publications has announced the publication of five new products for 1998: *1998 Shortwave Frequency Guide*; *1998 Super Frequency List on CD-ROM*; *1998 Guide to Utility Radio Stations*; *Digital Data Decoder Screenshots*; and the *1998 ARRL Handbook on CD-ROM*. The *1998 Guide to Utility Radio Stations* is now in its 16th edition. It now includes dozens of sample screenshots of digital data transmissions. These guides are available from most sellers of hobby books and you can visit their Web site at: <http://ourworld.compuserve.com/homepages/Klingenfuss/>.

## Digital News

Globe Wireless has announced the addition of two new stations to the Global radio network: LSD836, Argentina and 8PO, Barbados. LSD836 will use the following frequency pairs (shore tx/ship tx): 4326.0/4160.5; 8459.0/8311.5; 12736.0/

12379.5; 16976.0/16506.5; 19706.0/18850.0 kHz, while 8PO will be on 4214.5/4176.5; 6330.5/ 6284.5; 8433.0/8393.0; 12615.5/12513.0; 16841.5/16718.5; 19696.5/ 8886.0 kHz. Signal reports are welcome. All Globe Wireless stations use selcall 1094. The callsigns now aligned with Globe include: A9M, KEJ, KFS, KHF, KPH, LSD836, SAB, VCT, VIP, WCC, WNU, ZLA, ZSC, and 8PO.

## Reader Mail

Perry Crabill Jr. notes that the new fourth edition of the booklet, *Non-Directional Beacons of Europe*, by R. A. Connolly is now available. This edition has extended coverage and now includes most of North Africa and the Persian Gulf with over 2800 aero and marine NDBs listed. The format is as in previous editions; Aero, Marine and a reverse frequency listing sections. This new edition also includes a new unidentified section. Basically the coverage area is from 60 degrees West to 60 degrees East and from the Arctic to 10 degrees North. For more information write R. A. Connolly, GI7IVX, 21 Eleastan Park, Kilkeel Co. Down, Northern Ireland, UK BT34 4DA. I might also add the Worldwide UTE News (WUN) club has released its 1st edition Frequency Guide CD-ROM. The CD contains two-and-a-half years of utility station logs under 30 MHz made by their members sorted by frequency and callsign. It also has all past WUN newsletters, a collection of the former Speedx Club's electronic edition newsletters, a sounds directory containing .wav files of digital modes and sounds heard on shortwave including the Cherry Ripe numbers station jingle, ANDVT, and others. Cost is \$14.95 to club members and \$16.95 to all others. Visit their Web site at <http://www.gem.net/~berri/wun> for more details, or order via my P.O. Box 4222, Youngstown, OH 44515-0222 address as I became chairman of this project. If your club has news that relates to any of the utility station fields, drop me a line. I'm glad to let folks know your club is out there. Having come from a club background, I strongly believe in the efforts of these folks who volunteer for the hobby.

Alan Gale reports that indeed Plymouth Rescue did close down operations on Dec.1, 1997 at 1200 UTC. He was lucky enough to listen on 5680 kHz. They called all the aircraft it was keeping watch with and delivered the following mes-

sage: 1200 UTC: "Sierra 125, Sierra 169, Sierra 193 and Alpine 95, this is Plymouth Rescue now ceasing operations. Contact your new controlling agency Kinloss Rescue, best wishes and safe flying. This is Plymouth Rescue out." Kinloss then welcomed all the above stations with the following message: "Sierra 125, Sierra 169, Sierra 193 and Alpine 95, this is Kinloss Rescue. ARCC Kinloss has assumed operational control from ARC Plymouth at time 1200. Welcome, we look forward to providing you with our best service in the future over." All four stations then called Kinloss and confirmed the message. Another station ID and callsign lost to history.

Lee Parshook (SC) checks in for the first time with some beacon catches made with a RadioShack DX-440. Lee also sent information that further explains the beacon ID assignment system by the FAA. Lee writes "navigation aid identifiers are assigned by the following standards: Instrument Landing System (ILS) Localizer's and Associated Distance Measuring Equipment (DME). The initial ILS localizer is usually assigned the same identifier as the airport it serves. (This may be altered if the airport has not yet been assigned a three-letter identifier, or if the airport ID begins with a "K", "N" or "W." If additional localizer's are established, separate three-letter ID's will be assigned to each localizer. (This is regardless of the operating frequency of the ILS. Even though two different ILS's that serve the same airport may use the same frequency, they must have a separate ID for each system. It's a safety matter in addition to others.) The letter "I" is added to the beginning of the ID to designate an ILS system. For example both the localizer for the ILS ry32 and ry14 use the same frequency at YNG-110.1. But they have different ID's to differentiate which runway/ILS is in use. Both systems cannot radiate simultaneously since they're on the same freq. Using this info, you could tune into 110.1 and listen for the morse code ID. If you hear I-MQK, the planes will be landing from the NW. If you hear I-YNG, they'll be landing from the SE.)

Example: Youngstown ILS Runway 32 ID is I-YNG. This was the first ILS installed at YNG. The ILS for Runway 14 (same piece of cement-opposite direction) is I-MQK. The general term "compass locator" also covers NDB/OM (Outer Marker), LOM (Outer Marker Compass Locator) and LMM (Middle Marker Compass Locator), regardless of output power or type. The term is only applied to

a non-directional radio facility which is co-located at the VHF outer or middle marker site of an ILS. (Note- this does not happen all of the time. The ILS for Runway 14 at YNG does not have a LOM associated with it and therefore is all VHF.) It is assigned a name code (five letters and must be pronounceable) and a two-letter identifier. The two-letter ID is derived in the following manner: (a) The three-letter localizer ID is considered a base. (b) The first and second letters of the three letter localizer identifier are assigned to the outer marker compass locator (LOM) and the second and third letters are assigned to the middle marker compass locator (LMM) if one exists. (You will always have a middle marker on an ILS. Whether its a NDB associated with the middle marker (LMM) is a different story.) Example: Youngstown Runway 32 Localizer ID AI-YNG, LOM ID-AYN, Frequency 338 MM ID-quick beeping tone in cockpit from a sensor. Frequency is VHF (Not associated LMM). NDB's are assigned three-letter ID's except when they are also the outer marker compass locator (LOM) or middle marker compass locator (LMM) of an ILS. The same basic three-letter ID cannot be shared by a terminal NDB and an ILS at the same airport, again a safety issue."

Great info, Lee. Also checking in for the first time is "Mac" McCormick (GA) who uses a Kenwood TS-140/MFJ949E/G5RV combination and a RS DX-394 with a RS multiband dipole. Now on with the show . . .

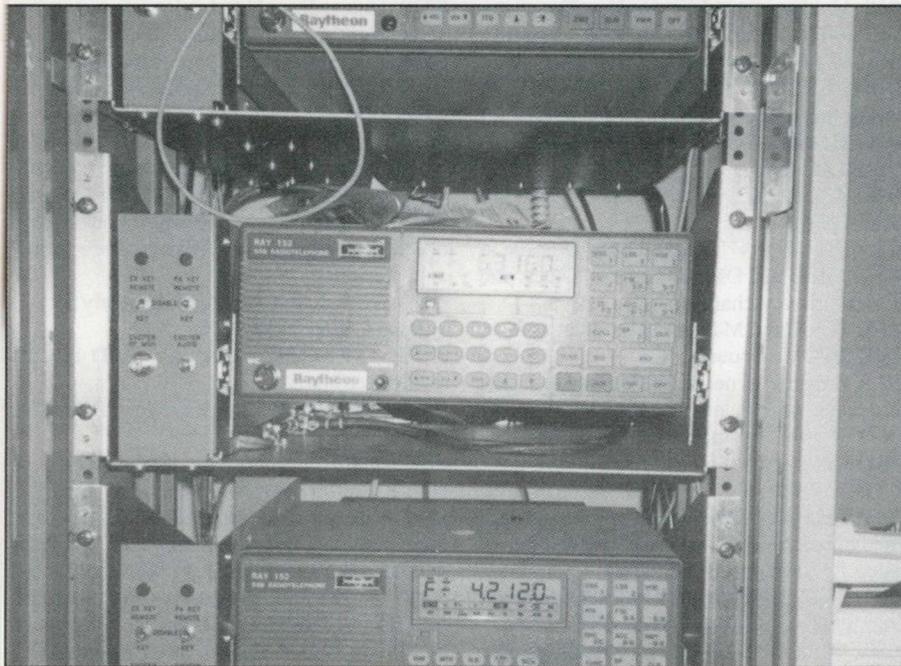
### UTE Loggings SSB/CW/DIGITAL

**207:** NDB CR, Charlo, NB, Canada heard at 0204. (BF)  
**214:** NDB CHX, Choix, Mexico, heard at 0218. (BF)  
**216:** CLB, Carolina Beach (Wilmington, NC) at 2010. (LP)  
**226:** NDB OA, Shingle Point, YT, Canada at 0211. (BF) OYI, Orangeburg, SC heard at 0048. (LP)  
**227:** CPC, Whiteville, NC at 0130. (LP)  
**230:** NDB SH, Shreveport, La at 0212. (BF)  
**242:** GGE, Georgetown, SC at 2013. (LP)  
**245:** JYL, Sylvania, GA at 2014. UDG, Darlington, SC at 2046. (LP)  
**248:** NDB WG, Winnipeg, MAN, Canada at 0229. (BF)  
**257:** SQT, Satellite, Melbourne, FL heard at 0148. (LP)  
**260:** AP, Casse NDB, Denver, CO at 0206. AVZ, Terrell, TX at 0207. (BF) BNL, Barnwell, SC at 2017. (LP)  
**272:** OJA, Weatherford, OK at 0330. (BF)  
**300:** NDB LAP, La Paz, Mexico, heard at 0258. (BF)

### Abbreviations Used For Intercepts

AM	Amplitude Modulation mode
BC	Broadcast
CW	Morse Code mode
EE	English
GG	German
ID	Identification/led/location
LSB	Lower Sideband mode
OM	Male operator
PP	Portuguese
SS	Spanish
tfc	Traffic
USB	Upper Sideband mode
w/	With
wx	Weather report/forecast
YL	Female operator
4F	4-figure coded groups (i.e. 5739)
5F	5-figure coded groups
5L	5-letter coded groups (i.e. IGRXJ)

**303:** NDB YPP, Parent, PQ, Canada heard at 0255. (RK)  
**325:** NDB YJQ, Bella Bella, BC, Canada, at 0211. (BF)  
**326:** BHF, Island NDB, Bahamas at 0213. (LP) NDB VV, Warton, ON, Canada heard at 0256. (RK)  
**329:** RVN, Rogersville, TN at 0216. (LP)  
**332:** NDB QT, Thunder Bay, ON, Canada at 0402. (BF) FIS, Fish Hook NDB, Key West, FL at 0226. (LP)  
**335:** LEE, Leesburg, FL at 0232. (LP)  
**338:** NDB PBT, Red Bluff, CA at 0417. CYR, Cairo, GA at 0418. (BF)  
**344:** JA, Dinns NDB, Jacksonville, FL at 2025. ZIY, Georgetown, Gr. Cayman Island, at 0249. CL, Cleveland, OH at 0235. (LP)  
**350:** NUC, San Clemente Island, CA at 0420. (BF) LE, Leevy NDB, Raliegh, NC at 0242. (LP)  
**356:** PB, Rubin NDB, Palm Beach, FL at 0445. (LP)  
**360:** KIN, Kingston, Jamaica at 0241. (LP)  
**366:** NDB CYO, Circleville, OH at 0421. (BF) YMW, Maniwaki, PQ, Canada at 0306. (RK)  
**373:** NDB 2R, Tyendingaga, PQ, Canada at 0307. (RK)  
**375:** RCZ, Roscoe NDB, Rockingham, NC at 0112. (LP)  
**376:** ZIN, Great Inagua, Cayman Islands at 0252. (LP)  
**378:** BRA, Broad River NDB, Asheville, NC at 2315. (LP)  
**379:** TL, Wakul NDB, Tallahassee, FL at 2317. (LP)  
**381:** MNI, Manning, SC at 2031. (LP)  
**382:** UPA, Alegre NDB, Allegre, Cuba at 0255. (LP)  
**385:** EMR, Emory NDB, Augusta, GA at 0238. (LP)  
**391:** DDP, Dorado NDB, San Juan, PR at 0303. (RK)  
**392:** ML, Charlevoix, PQ, Canada heard at 0304. (RK)  
**398:** TGQ, Elizabethtown, NC, at 0221. (BF)  
**404:** CKI, Kingstree, SC at 2039. (LP)  
**408:** NDB AD, Colby, KS at 0328. (BF)  
**410:** NDB BWR, Alpine, TX at 0330. (BF)  
**420:** CFY, Evans NDB, Lake City, SC at 2041. (LP)  
**2182:** Romeo 6 Mike clg/wkg Whisky &



View of WLC's transmitter rack showing 6316.0 and 4212.0, two of WLC's sitor frequencies (Photo by Joe Olig).

Tangol at 0339 in USB relaying msg fm CAMSPAC (probably Point Reyes, CA) to establish comms w/them & about ETA for tomorrow. (RK)

**2270:** JSR2, Mossad, Israel, hrd in USB heard at 2200; haven't hrd this freq for a long time. (TY)

**2626:** FTJ2, Mossad, Israel, hrd in USB at 2130, first time I've ever hrd Mossad stn on this freq. (TY)

**2749:** Halifax CG Radio, Canada, w/notices of drift net locations & wx from 0000-0030 in USB. (RK)

**2953:** KPA2, Mossad, Israel, heard in USB at 2145. Haven't hrd this one for a long time. (TY)

**3007:** CanForce 2621 at 2330 in USB w/pp via Trenton Military. (PB)

**3250:** North Korean nbr stn (R. Pyongyang) hrd in powerful AM at 1500. (TY)

**4028:** Atencion stn, SS/YL/5FG, at 0200 in AM. (CS)

**4035:** AAAT70U, others in Army MARS net at 0324 in USB. (RK)

**4154.5:** DRAX, German Navy masted training barque FGS Gorch Fock (A-10), used for training & sister ship of the USCGC Eagle, at 0559 in USB clg/wkg DHJ59, Wilhelmshaven Naval for RTTY coordination, she's a beauty under sail. (Ed.)

**4165:** Abnormal Mossad transmission hrd, YL rptng "Kilo Papa Alpha Two" for more than 30 mins in USB at 2111. (TY)

**4235:** IRA w/msg DE IRA K 4 8 12 LSN 4235/4320/8670/13015 in CW @ 0040. (CH)

**4241.5:** 8PO, Bridgetown, Barbados ARQ ready & signing CW at 2225 (New Globe Wireless stn). (FH)

**4271:** Unid stn 2RC8 Rptng "V 8L6S DE 2RC8" in CW at 2037. (TY)

**4348.5:** 9AR, Rijeka Radio, w/DE 9AR 2/3CH CH 3/4/7 K in CW @0032. (CH)

**4360:** CC/YL nbr stn hrd at 1310 in powerful USB. (TY)

**4417:** OM/EE pleasure boats, discussing wx & chit chat at 0043 in USB. (RK)

**4439.5:** Spook stn P7X at 1845 w/data & CW callup, usual format. (AWH)

**4448:** SAM 60202 (N. of Lajes AB, Azores) in USB at 0242 re Andrews AFB. (PB)

**4472:** NIGHTWATCH 01 wkg RESEMBLE at 0640 in USB on Zulu 130. (PB)

**4527:** SVR (Russian Intelligence), Cuba, "Fast CW" spook stn at 1122 repeating "538 00000". (AWH)

**4557:** Unid station sending 'C' monitored in CW over & over- any ideas? Hrd 0255. (should be Russian Navy, Moscow on 4557.9 -Ed.) REACH 5107 at 0050 in USB wkg u/i stn when they were cut off by powerful RTTY bursts at 4555. QSYed to 11232 but I couldn't hear anything there. First time I've hrd anything on this freq. (RK)

**4560:** YHF Mossad call at 0500 in USB, YL/EE w/5FG's. (MT)

**4604:** BLUEMOUND 199, NCS of Wisc. Civil Air Patrol Net at 0100 w/net check in's for Wisc. state CAP net. At 0130, KENTUCKY CAP 4 as NCS w/start of Ky. state HF SSB directed net, & into check in's. Both in USB. (Ed.)

**4630:** SVR Numbers, Cuba at 0400 in USB, OM/EE w/347 callup w/usual strange voice, another one going simultaneously on 4480 w/378 callup, both into 5FGs 2x. (AWH)

**4724:** Offutt w/EAM for FPBCAJ at 0039 in USB- echoed by MacDill, McClellan, & Thule, //11175, 8968, 11232. (RK)

**4742:** NIGHTWATCH 01 at 0339 in USB

wkg Andrews (QSY to 6761 USB). (PB)

**4770:** YL/North Korean nbr stn (R. Pyongyang) hrd in powerful AM at 1400. (TY)

**5154:** "F"-Russian Navy Vladivostok single letter HF CW marker at 1201. (TY)

**5156.5:** "P" marker in CW @ 0058. (CH) (Russian Navy Kaliningrad, was 5153.8 -Ed.)

**5277:** PANTHER, DEA, Nassau, Bahamas heard at 2350 in USB wkg 20 CHARLIE (prob CG HH60J 6020) req they refuel asap upon landing. Ltr hrd up w/ATLAS on 7657.0 USB. (MT)

**5320:** CG Group Corpus Christi at 0530 in USB wkg Rescue 2125 (HU-25B), 2125 is RTB at this time. (DW)

**5341:** Cuban Babbler at 1247 idle, w/strong carrier. The only one to show up all week. 5688 has been silent all week also. (AWH)

**5347:** SVR (Russian Intelligence), Cuba, numbers st., at 1200, OM/SS w/"387 387 387 00000" null msg repeated. (AWH)

**5377:** 'LTN' & '20' New Zealand Army Net 1935 UTC USB w/routine msg. (IJ)

**5383:** ZKCT, Civil Defence Net, Palmerston, North New Zealand at 2025 w/weekly roll call of Lower North Island Civil Defence Stations on CH# Foxtrot in USB (Resumed their weekly HF Schedules after a long absence). (IJ)

**5386:** Civil Defence Stations ZKNT Auckland, ZKCT Palmerston North, ZKHQ National HQ Wellington & ZKST Christchurch New Zealand at 2020 in USB w/radio cks on the national clg & emergency channel, CH# Alpha. (IJ)

**5389:** ZKNT, Civil Defence Net, Auckland, New Zealand at 2010 in USB w/weekly roll call of Upper North Island Civil Defence stations on CH# November. (IJ)

**5396:** Unid tactical comms at 2150, BLUE wkg YELLOW, "go ahead & pass your traffic" then several 5MGs (mixed alfa-numeric groups) by voice, read w/funny voice, then both out. Both strong, not heard before or since. (AWH)

**5400:** YOG37, Bucharest Meteo, ROU at 0608 in RTTY 50/425 w/AAXX meteo code reports. (Ed.)

**5404:** Dept of Conservation, Tauranga, New Zealand at 2350 in USB w/2 mobile units. One was mobile between Rotorua & Taupo in the Central North Island. Activity went on through out the day w/hourly sitreps. (IJ)

**5430:** Poss Corsica? at 2305 in ARQ-E 192/400, noted nightly, sometimes strong, but no tfc noted. (AWH)

**5437:** ART, Mossad, Israel, hrd in USB at 1730. (TY)

**5456.7:** Unid French military at 1300, ARQ-E 96/400 idle, no CdV seen, prob either part of Noumea-Tahiti or Martinique-Tahiti link, all of which unheard on usual higher freqs at time. (AWH) (supposedly is Tahiti to Ft de France but not confirmed here -Ed.)

**5459:** Unid, France at 2235 on, prob REGTRANS/Army, in ARQ-E 72/400, idle past 0400, return link noted on 5254. Left decoder on all night, no tfc. (AWH)

**5500:** Unid mil tactical, LEAD 1 wkg TRAIL 1 at 1149 in USB, tfc re scout advises second

segment of convoy hasn't caught up, so maintain 45 MPH. Also talk about civilian vehicular infiltration. Presumed Army National Guard. (AWH)

**5505:** Shannon Volmet w/ wx info in USB @ 1745. (CH)

**5510:** MUH12, unid British Military stn at 0620 in RTTY 50/850 w/RYY, Quick Brown Fox & "Of all the fish in the sea the mermaid is the one for me" tests. (IJ)

**5550:** Balair 169 at 2321 wkg New York, FL 370, est OWSKY at 2351, selcal BJ-CQ. Clipper 78 at 2325 wkg NY, est LAMER 2330, selcal CM-FJ. All in USB. (TO)

**5598:** Gander ATC wkg EL-AL 2343, Air India 764, others at 0023 in USB. (RK)

**5616:** N311AG at 2232 wkg Gander, 56N30W FL 310, selcal FK-EM. Polar Tiger 603 at 2338 wkg Gander, 55N30W FL 280, selcal EM-CK. Both in USB. (TO)

**5628:** San Francisco Aeradio wkg various a/c at 0835. (TY)

**5680:** Kinloss Rescue, G, wkg Warlock 33 at 1343; PC426 (D) wkg Glucksburg Rescue at 1458; R110 - helo (IRL) wkg Glenhead R & Finner Ops at 1152; Stavanger Rescue (NOR) wkg Sabre 53 at 1252; Sabre 53 r/check w/Kinloss at 1254; Watchdog 94 (G) wkg Kinloss at 1146; Sabre 33 wkg Bodo Rescue (NOR) at 1513 (QSYed to 6544, then 4675 to see if reception was better, then went back to 6544! (AG)

**5687:** WISE 81 (AC-130 'Spectre' gunship fm 16th SOW Hurlburt Field, FL) at 0252 in USB clg "Any station this frequency." 1st time I've hrd anything here. (RK)

**5688:** Cuban Babblers heard at 1324 idle, good level, only time noted during past couple of weeks. (AWH)

**5715:** North Korean/YL nbr stn hrd in AM at 1400. Another day same stn hrd at 1400 on 6215 kHz. (TY)

**5731:** YRR4, Bucharest Meteo, ROU at 0610 in RTTY 50/425 w/wx synopsis. (IJ)

**5841:** At 2131 20 CHARLIE w/posn & flight ops to PANTHER. At 1859, SHARK 27 & PANTHER discussing data-buoy & deconfliction w/playmate. (MF)

**6330.5:** 8PO, Bridgetown, Barbados ARQ ready & siging CW at 2210. (FW)

**6357:** SAA, Karlskrona, Sweden w/QSX H24 500/4195/6292.5/8375.5 QSW 6375 QRJ CALL 4/6 MHZ in CW @ 2355. (CH)

**6386.6:** ZSJ, South African Navy, CommCen Cape, Silvermine RSA at 0410 in CW w/CQ marker. (Ed.)

**6625.8:** Unid at 0000 on, supposed Cuban-Angolan MIL station here again evenings, mostly just open space tone on 6625.3, but some 1000 Hz shift sloppy CW. No RTTY noted. (AWH)

**6683:** Andrews VIP wkg SAM 206 at 2149 in USB. (MF)

**6730:** Air Force 2, a/c w/U.S. Vice President on board, at 1820 in USB wkg Andrews w/incoming pp's from CROWN. (Ed.)

**6739:** LOOK 76, EC-135 Looking Glass a/c, heard at 1710 in USB clg 'mainsail' no joy here. (MT)

**6810:** Unid presumed Philippines Meteo station at 0745 in RTTY 75/ 850 w/RYY, RPAO RPAO then brief WX synopsis. (IJ)

**6815.6:** USCG-10 CHARLIE at 2159 in USB passing posn & flight ops to SHARK 07, at 2208 SHARK 07 discussing flt plan w/10 CHARLIE. (MF)

**6822:** YL/SS 5FG nub stn in AM at 0330 (Mon). (PB)

**6823:** 'ST' & 'S4' Tongan Defence Force at 0850 in USB w/2 OMs in Tongan. This is one of their primary channels. (IJ)

**6868:** The Bored Man numbers stn at 1426 in USB, SS/OM w/counts. (CS)

**6927:** Cuban CW net at 1348, control station here keys //5314, always crossband (6546 noted wkg this one previously). (AWH)

**6932:** Cut numbers in CW in progress tuned at 1312. (CS)

**6962:** Unid Gupco Oil Station at 0545 in ARQ, first half of the msg was fairly garbled due to heavy ANDVT Interference. (IJ)

**6993:** SAM 27000 at 0553 in LSB w/pp Sam Command via Andrews AFB. (PB)

**7039:** "K" (Khabarovsk), S (Arkhangelsk), C (Moscow)-Russian Navy single letter HF CW markers at 1729. Three SLHFM stns hrd simultaneously on this frequency. First time I've ever encountered "K" stn on this frequency. (TY)

**7583.7:** FDX, RFFVA, Paris ARQ-E3 200/400 to RFFVAD N'Djamena at 2230, also on 8094.7. (FH)

**7726:** YL/SS numbers stn at 0500 in AM w/5FG, possible Cuban. (GS)

**7944:** SVR, Cuba at 1940 on, seemed to be testing, RTTY 75/500, machine & hand-keyed 5FG cipher tfc, mostly repeating same msg over & over w/priority 11100 & link 00103 (nominally used for relay tfc to YFC per WUN). Pulled plug here 1953. At 2004 found on 5814 doing the same thing, same link ID, 2013. After 2100 was sending CW by hand on 7947, running RTTY again at 2135 recheck. 2200 back to 5814 RTTY again, w/callup for U1K, more dummy tfc to 2215\*. (AWH)

**8026:** SAM 28000 at 0459 in USB clg Andrews (No joy). (PB)

**8033:** SS/YL 5FG # station in LSB at 0332 (Tue). (PB)

**8040:** Unid Australian Commercial Fishing Station at 0610 in USB w/2 OMs talking about export fish prices to Japan and the USA. There are about four fishing companies licensed to operate on this freq. (IJ)

**8047:** PACOM 01 at 2035 in USB w/pp to Offutt Metro & CP via Andrews. (PB)

**8080.5:** EAE220, MFA Madrid, Spain at 0740 in TWINPLEX w/10LG's. (IJ)

**8222:** Unid at 1540 w/speech inversion enciphered speech. QRT at 1544. (DW)

**8240:** NRLT, USCGC Resolute (WMEC-620) at 2040 in USB wkg NMG, CommSta New Orleans, simplex, w/pp to District-8 Op's. (MT)

**8316:** Navy Auckland heard at 0559 in USB wkg N8H w/radio ck, adv is signal strength 4 & no synch on secure, request they reload (crypto). (DW)

**8320:** Cherry Ripe Number Station at 1200 in USB w/music and '77350'. (DW)

**8326.7:** Egyptian Embassy, Havana at 2300 in ARQ w/plaintext AA circulars. QRT at 2306. (DW)

**8335.5:** DRKT, FGS Westerwald, German Navy Type-760 Ammunition Transport (A-1435) at 0621 in USB clg DHJ59: German Navy, Wilhelmshaven for radio check. (DW)

**8356:** Cut numbers in CW in progress heard at 1232. (CS)

**8422:** NRV, USCG Guam, ARQ ready signal, signing CW at 2150. (FH)

**8435:** 4XZ, Haifa Naval, Isr, w/ID in CW @ 1800. (CH)

**8515:** 5AT, Tripoli Radio, Libya w/ID in CW @ 1850. (CH)

**8597:** CKN, Comox Lazo B.C. at 0056 in RTTY 75/760 w/plaintext wx tfc in EE. QRT at 0100 in mid-text, into FAX 120/576 w/surface analysis chart. Back into RTTY 75/760 at 0121 w/call-tape & tfc. At 0200, into FAX 120/576 w/surface prognosis chart. At 0221 into RTTY 75/760 w/call-tape and tfc. Again at 1156 in RTTY 75/760, into FAX 120/576 at 1200. (DW)

**8638:** VNG time signal at 0715 in AM (weak signal). (PB)

**8846:** Frenchline 601 at 2052 in USB wkg New York reporting at DEENO, FL 330, selcal BK-DJ. (TO)

**8861:** Dakar Radio at 2010 wkg Roberts Radio w/tfc rpt re: RKA412/A300 TU-TAO. Nouadhibou R. at 2020 wkg Nouakchott re: Mauritanie 487. At 2323, Air France 443 wkg Recife for selcal HL-FJ. All in USB. (TO)

**8864:** Reach CI24 at 2059 in USB wkg Gander for KBGR & KDOV wx. (TO)

**8888:** SP-ANB or -ENB at 1914 in USB wkg Luanda ACC abeam CV 1912. A/c type Il-18 or An-28, not sure due to muddy xmsn. (TO)

**8891:** Churchill Radio (Manitoba) wkg u/i a/c w/selcall ck AR-BF at 1917 in USB. (RK)

**8894:** TU-VAD at 2118 in USB wkg Niamey, just caught ETA Abidjan 2341 & selcal BC-HP. (TO)

**8959:** Khartoum Air, Sudan, at 0540 in USB w/YL TXing in the blind relaying a/c posn report. (IJ)

**8968:** SAM 60206 at 0228 w/pp to Andrews VIP via Hickam AFB. (PB) LURCH wkg Western Sky for location of contacts at 0112. (RK) TURBO 90 at 2036 wkg Andrews w/pp to SHOCKER: unable AR w/SPIRIT 11 due right hydraulics failure ETA McConnell 2215Z. (TO) All in USB.

**9006.7:** Egyptian Diplo, unid embassy, at 2345 in ARQ 100/425 w/ATU-80 tfc. (Ed.)

**9057:** At 2055 unid stn in USB req AC-1 switch to Ch.11, sounded like there where sending Selcal tones. (MF)

**9063:** YL/SS at 0200 in AM w/5FG, returned after being inactive for several months. (GS)

**9065.5:** 'MUH4,4B,7,7A' & 'MUH7C' in Australian Army Net at 0725 in USB w/radio cks, dinner menu. (IJ)

**9153:** YL/SS at 0500 in AM w/5FG, possible Cuban. (GS)

**9263:** Cherry Ripe nbr stn hrd in USB at 2200.

Also noted on 15616/12056 kHz. (TY)  
**9320:** SAM 86971 at 1749 in USB w/pp via Andrews. (PB)  
**9328:** XVN, VNA Hanoi at 1458 in RTTY 50/600 w/EE nx. (DW)  
**9958:** The Counting Station EE/YL in progress at 1428 in USB. (CS)  
**10100.8:** DDK99, Hamberg Meteo in RTTY 50/425 RY's monitored at 1456, then CQ DE DDK2 (4583) DDH7 (7646) DDK99, then meteo wx. (FH)  
**10204:** VARIABLE at 2058 in USB reading EAM type message to NIGHTWATCH. (MF)  
**10780:** USS Scott monitored at 1948 in USB w/kg Cape Radio (QSY 5246 USB) for STS-86 launch. (PB)  
**11180:** USAF Incirlik GHFS w/SAM 27000 at 0500 in USB w/pp's to Kiev. (IJ)  
**11181:** USAF Hickam GHFS w/PACAF 01 & PACOM 01 at 0505 w/pp's, the Hickam operator was getting confused w/which phone call went to what a/c. (IJ) RAID 89 at 0019 w/pp NORDIC CONTROL via Thule. (PB) Both in USB.  
**11208.8:** FDI8, French Air Force, Nice w/ID in CW @ 1157. (CH)  
**11220:** SAM 60202 & CASEY 01 at 0301 in USB w/kg Andrews AFB. (PB)  
**11267:** RASPUTIN (prob E-6B) at 1827 in USB w/80 character EAM string. (MT)  
**11330:** American 664 at 2031 in USB w/kg New York reporting at LAMER, FL 350, selcal BP-FG. (TO)  
**11396:** D-ABUE at 1853 in USB w/kg New York for selcal using reg instead of Condor flight number, selcal CM-QR. (TO)  
**11483:** RFGW (P6Z sometimes), Paris, in FEC-A 192/400 at 1340 w/FF msg fm Minister of Defense. (FH)  
**11494:** NIGHTWATCH 01 at 1708 in USB w/kg Pure Gold on Zulu 205 (OSY to Zulu 295). (PB)  
**11545:** Lincolnshire Poacher in USB @ 1425 ended @ 1445 w/tune (only time played). (CH)  
**11553:** Vostok Base Antarctica at 0535 in USB w/2 OMs in EE & RR one of them sounded like he could have been in a plane re back ground noise. (This was rather unusual considering this is the US Freq. Maybe it's also now being used for liaison purposes w/other stns). (IJ)  
**11557:** V5G, Romania (MFA) at 2058 in ROU-FEC 164.5/400, RM lang press review, 2101 suddenly off. (AWH)  
**12197:** Counting Station in EE at 1400 in USB. (CS)  
**12353:** At 1613 in USB, a Russian military ship telling a Russian fishing boat that they were not authorized to be at this location & to return to their waters near Juneau. They were told to return to their clg frequency of 12365 kHz. (BF)  
**12356:** ZLM, Taupo Maritime Radio, New Zealand at 2020 in USB, YL w/wx forecasts for the South-West Pacific & a cyclone warning. (IJ)  
**12565:** UAZG, BMRT Ivan Bochkov at 2357 in RTTY 50/170, a Russian- flagged 2,934 DWT Bol'shoj Morozil'nyj Rybolovnyj Trauler (BMRT), w/RYRY/DE to UDK2,

Murmansk Radio, Russia, then w/admin TG from master KMD Lysyay using hull#/ID MB-0001, app ex-ULYT. (Ed.)  
**12603:** Lincolnshire Poacher lady passes 5FG's in USB at 2100. (TY)  
**12668:** A9M, Manama w/ARQ ready & signing CW at 1350, heavy 100/850 RTTY QRM at 12668.5. (FH)  
**13015:** IAR, Rome Radio, I, w/4 8 12 16 22 MHZ = WE LSN 22 AND REPLAY ON 17206.1 K in CW @ 1325. (CH)  
**13089:** CAMSLANT at 1927 in USB w/pp for USCGC Harriet Lane; at 1929 clg cutter Vigorous. (MF)  
**13205:** LXTLA at 1753 in USB clg Burr? (sounded like) Radio. (PB) (Berne Radio LDOC Switzerland, LX-TLA is an a/c reg. for a DC8-F of Cargo Lion of Luxembourg -Ed.)  
**13242:** KGD34 at 2045 in USB discussing ARQ-LINK problems w/the Shares BBS w/unid stn. (MF)  
**13244.2:** KGD34, Virginia NCC BBS at 1943 in PACTOR-100/200 w/NNN0AJK w/kg, both good but having trouble w/kg each other. (AWH) (KGD34 is Nat'l Comm Ctr of Nat'l Comm System, Arlington, Va -Ed.)  
**13257:** NATO 17 at 2030 in USB w/kg Trenton Military. (PB)  
**13264:** Shannon Volmet w/wx info in USB @ 1406. (CH)  
**13412:** SVR, Cuba, "Fast CW" spook at 2147 w/5FG t/c. (AWH)  
**13506.8:** AAR5BS and AA6USA in Packet w/encryption both ways at 2145. (FH) (note the first "A" in both calls dropped due to packet protocol - Ed.)  
**13533:** EZI2, Mossad, Israel hrd in USB at 1300. Also noted on 15980 kHz. (TY)  
**13920:** AXM35, Melbourne w/120/576 FAX to 1400 w/LSB voice QRM. (FH)  
**14940:** Durmont d'Urville Antarctica monitored at 0405 in LSB, OM/FF. This came on just after 14940.7 ARQ-E3 circuit had stopped Xing. (IJ)  
**15011:** SAM 26000 (DV2 + 35) at 1635 in USB w/pp 1st Airlift Sqd via Andrews. (PB)  
**15682:** Lincolnshire Poacher lady passes 5FG's in USB at 1100. Also noted on 16084/14487 kHz. (TY)  
**16903:** UIW, Kaliningrad Radio in ARQ w/"DOBROG DE UIW" at 1400. (FH)  
**16976:** LSD836, Buenos Aires Radio, Argentina w/ARQ ready signal & signing CW at 2230. (FH)  
**17904:** San Francisco Aeradio w/kg Air Mike 712 in USB at 0250. (TY)  
17937: Lima LDOC (Flight Support), Peru (SAM LDOC) at 1556 in USB w/kg American flt w/posrep, 1st time in a long time here. (Ed.)  
**17976:** EVAC 6 DELTA 6 at 2056 in USB clg MAINSAIL. (MF)  
**18411.5:** MFA Jakarta, Indonesia monitored at 0755 in FEC-S 96/250 w/5LGs to Dhaka & Rangoon. (IJ)  
**18421:** Unid station in SWED-ARQ 100/365 to 1530. (FH)  
**18648.5:** CLP1, MFA Havana, Cuba at 0445 in RTTY 50/500 w/nx in SS. (IJ)  
**19301:** Unid maybe Cape Radio here, 2250 on, some kind of FDM mux tx here w/various

FSK IRIG (Inter-range Instrumentation Group) format timing signals; 10 pps FSK 200 Hz shift signal centered on 19301; 19307 center had a 1 pps timing signal exactly the same as that carried on WWV's 100 Hz subcarrier. Both signals synchronized exactly w/WWV. In between freqs there were a couple of unknown format signals consisting of a 4 sec rotation between 3 tones of 1 sec length each. Suspect timing signal transmission for ESMC down range sites associated w/the Delta II or Titan 4A launches. I'm rusty on IRIG formats, but think 19301 would be IRIG-B or -C and 19307 so-called "Slow Code". (AWH)  
**20011.7:** Unid in ARQ at 1347, guess Pakistan, or Pak. Embassy in Rabot. (FH)  
**20018:** CLP1, Cuban Ministerio de las Relaciones Exteriores (MINREX), Havana, Cuba, at 1618 in RTTY 50/425 w/MINREX circulars to unid Embacuba, then into CW. At 1710 up in RTTY w/77 grp msg to CLP7, Embacuba Congo. (Ed.)  
**20065:** Unid Yachts at 1400 in USB, QSO incl m/v Rumrunner, others, talk about groups of vessels, maybe related to that round-the-world yacht race. (AWH)  
**20286.5:** SPW, Warsaw Radio in FEC w/Polish nx start at 1400. (FH)  
**20474:** EE/YL num stn at 2338 in USB w/5FG's. (PB)  
**22656.5:** UFL, Vladivostok Radio, Russia at 2340 in RTTY 50/170 w/ msg about International exchange rates to the rouble. (IJ)  
**22858.2:** CCS, Santiago in RTTY 100/850 w/5LG's at 1615. (FH)  
**23237:** UK (tent) MKJ monitored at 1406 w/CW METAR wx like seen elsewhere, weak. (AWH)  
**23238:** MKL, Pitreaxie, Scotland, used to be 75 now 100/850 RTTY at 1500 w/strong signal. (FH)  
**23716.7:** RFLI, FF Martinique at 2220 in ARQ-E3 96/400 ckt LIH to Tahiti, up from 19216, fair signal but "hung" repeating VZCZ-CL through the following morning (this evidently is NOT a high priority circuit given it's usual state of neglect by the operators). (AWH)  
**25000:** BPM, Time Standard stn, China in AM w/distinctive hum at 0130. (TY)  
**26124:** CLA, Havana Radio, Cuba at 2013 w/CW marker, poor during short F skip opening to Caribbean. (AWH)

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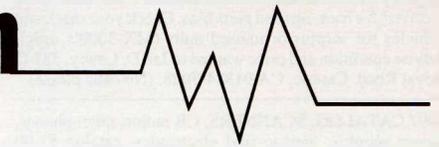
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# The Loose Connection

BY BILL PRICE, N3AVY

RADIO COMMUNICATIONS HUMOR



## The Family That Communicates Together . . .

Confession, they say, is sometimes good for the soul. Well, it's no secret that this oversized body could use a little work on its soul, so:

My wife Shannon\* never shared my interest in shortwave radio. Or scanners. Or CB radio. Or having several miles of wire and cable among my more prized possessions. Neither did my son. I always figured it was a character defect on their parts, and thought if I waited long enough, they'd come around.

Hallelujah and eureka. Hoover, even. They have both seen the light, though it has taken one score and three years for my son, and a bit longer for the lovely Shannon Rodham Price.

Young Scott recently had the opportunity to ride some two thousand miles in a rented van with a CB radio in it. Unlike the days of his youth, this trip found him "in charge" of the radio, as he was more qualified (his dad has a ham license) than anyone else aboard. After a few hundred miles of listening, he got the hang of the jargon and invented a voice that sounded like a professional driver with some five million miles under his kidney belt.

I never knew he had taken the trip until he called me from atop the Sears Tower and said, "Betcha can't guess where I am."

A few weeks later when he was home from college, he told me about the trip and asked if we could go and pick out a CB radio for his car. I hid my surprise (and excitement) that he had developed an interest in some aspect of communication. I told him we could. He told me of the fun he had talking with professional drivers from all over, and mentioned that given his driving record, a CB in the car might turn out to be a real money-saver. He had me there.

He was appalled when I drove into the parking lot of a sort-of permanent flea market, and told me—with panic in his eyes—that he wanted a new radio—not some old piece of junk with tubes. When I asked how much money he had with him, he began to see some merit in shopping for a used radio.

The 25-year-old Kraco DeLuxe had no mic, and the \$10 price quickly dropped to five. All my son saw was a grimy radio with no mic, and a snowball's chance in hell of finding one to match the Kraco plug. I saw a great 23-channel radio with a couple watts of audio power, a reasonably good speaker, and a place to use the spare Kraco mic I had at home.

We looked in several "junque" shops for a nice mag-mount antenna, then called everyone I knew who might have one in their garage or basement. It pained me to buy a new one, but we found a decent unit for eighteen bucks.

All the way home I told my son how good the old Kraco was compared to the low-end brand-new rigs he hoped for. He started to notice the old radio's heavy chrome plating and asked if we could clean it up when we got home.

"Sure," I said. "That's the fun of it."

When we got home, I opened the unit, blew the dust out of it, and explained the "damp rag" cleaning process to Shannon\*, who came to see what we were up to. Scott got alcohol, cotton swabs, and a spray bottle of window cleaner. By the time he was ready to reassemble the case and put the knobs and buttons back on, the rig looked like a '59 Cadillac.

His biggest shock came when I produced a pristine Kraco microphone with a four-pin plug—an exact match for the radio's socket. "I knew I had it," I told him as he cleaned the grooves with a cotton swab.

"I want to install it, OK?" he asked.

"Sure," I said.

"Do you have any books on how to do it - how to tune the antenna?" I rummaged around for copies of my own articles on how to install a mobile CB radio, how to get (and keep) your SWR low, and at least four others. He was halfway through the first one when he realized they were written by his old man.

"Y'know, I thought the writing seemed familiar, he said. He spent an hour or so mounting the radio, then came and asked me about tuning the antenna.

A five-minute rundown had him on his own. He was really surprised when I showed him how to make a field-strength meter from a diode clipped to the leads of a voltmeter.

His work looked fine. Either my son was brilliant, or my articles were very well written. Either way, I win. He tested the radio in the driveway, but at that late hour, there wasn't enough truck traffic to make it fun, so he prepared to drive off to our nearest interstate highway. "You coming?" he asked. "Sure—lemme get my jacket," I said. It's really nice to find the first common ground with your adult offspring. I demonstrated the finer points of sounding like a professional driver, even to the point of tuning the car's broadcast FM radio to "hash" in between stations to simulate "cab-noise." It was the wrap-up of a great day.

As to my lovely wife, I recently came home with a brand-new 20-channel scanner from the clearance shelf of our local radio store. It was worth far more than the asking price of \$29.95. Shannon\* said, "Can I have this one for the fire and ambulance? Could you get those and the sheriff and state police on this one?"

Just the local ones—not the far away ones like on your scanner. You have too many channels on yours—I never know what's what on yours," she said.

I set up the radio on an out-of-the-way corner table, programmed in all the necessary frequencies, and showed her the fine points of the scan, delay, and lock-out controls. Now she dashes to turn it on when a siren pierces the silence outside our home. Life is good.

*Editor's note:* Bill has begun speaking in Morse Code around the house. He thinks his family is catching on, but his wife confided in me that they're just ignoring him.

\*Name changed to protect the innocent.

"The VX-1R is smaller than most pagers!"

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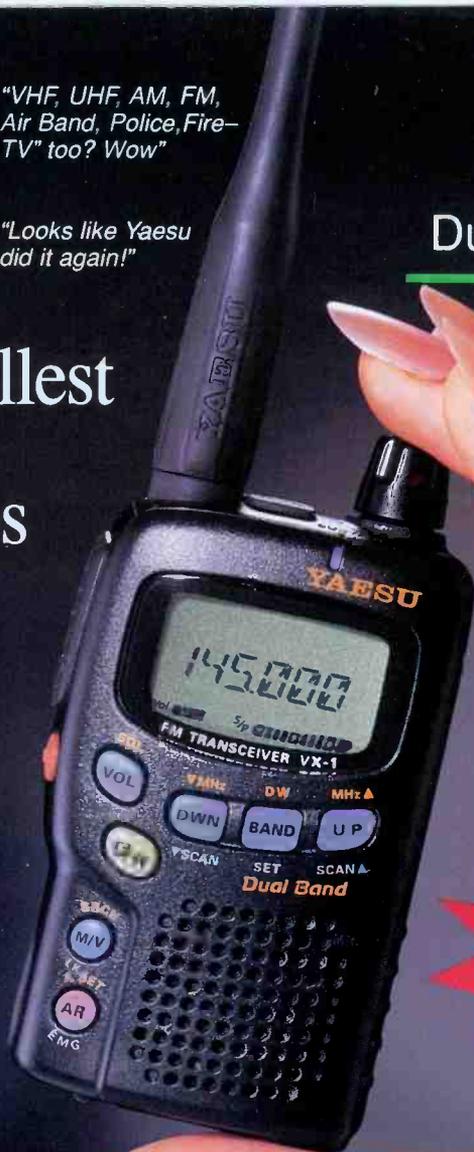
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## The world's smallest HT with all the high-tech features you'd want in the world!

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and Help  
Menu  
Function

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DB32 Antenna Optional



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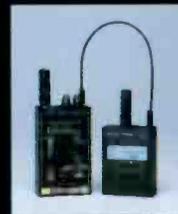
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- Reaction Tune with AR8000, ICOM R7000, R7100, R8500, R9000, ICR10, Optoelectronics New R11 Test Receiver, and the Radio Shack Pro 2005/6 with the OS456 or OS456Lite installed or the Radio Shack Pro 2035/42 with the OS535 installed
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Reaction Tune with the AR8000



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