AN INFORMAL GUIDE TO NDB HUNTING

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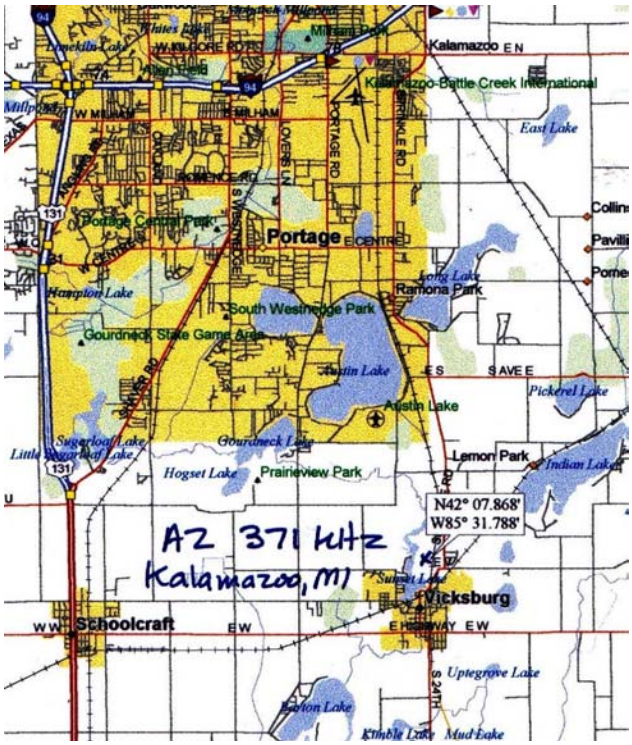
During the summer of 2001, we visited a good share of the non-directional radio beacons (NDBs) in our part of the State of Michigan. We made two trips that eventually resulted in an article, *The Michigan NDB Tour,* available at the Beaconworld web page run by Alan Gale G4TMV (1). It describes in detail the NDBs we visited with photos and audio recordings. This article will deal with the way we found the beacons and some of our experiences along the way that might help someone else thinking about setting out on their own "NDB tour".

Some NDB aficionados like to use simple radio-direction finding to locate beacons while they're on the road. This may involve nothing more than an inexpensive portable receiver that has an internal ferrite rod antenna. By stopping at several points and taking rough bearings by peaking the received signal, the listener can get a good idea of a beacon's general location. Even better results are possible using a communications receiver and a tuned or untuned loop. Kriss Larson has written an interesting article in *Lowdown,* the bulletin of the Longwave Club of America, about his use of the first technique to find three uncharted NDBs in or near the infamous "Area 51" in Nevada (2). Sheldon Remington discusses the second approach to RDF in his excellent series *On the Art of NDB DX-ing* available online at the LWCA web site (3). This also has drawings that illustrate the most common types of NDB antennas – a useful "field guide" for the neophyte beacon tourist.



Radio-direction finding can be a lot of fun but it is also very time consuming. Since time was not something we had in abundance, we pinpointed the location of each beacon we planned to visit before we left home instead. This was quite easy to do with DeLorme's *Street Atlas USA* CD-ROM. We simply entered the geographic coordinates of an NDB and the program showed its location in relation to nearby roads and major natural features like rivers or streams. We found that these maps were usually very accurate and allowed us to find most of the beacons on our list with very little trouble. In fact, the maps led us astray only twice.

The first time was the result of bad data. This involved CVX on 392 kHz in Charlevoix, Michigan. RDF would not have found this beacon since it was not yet back on the air, following a move to make way for a new airport terminal building.

CVX 392 kHz – Charlevoix, Michigan

Two sources had different sets of coordinates for the new beacon, both of which indicated that it was off the airport grounds, not far from Charlevoix's harbor. Unfortunately, these coordinates proved to be grossly inaccurate and so were the maps based on them. As a result, we drove around the area for several minutes and came up empty-handed. But when we retraced our steps, there it was, right where an airport homing beacon should be - at the airport!

CXK 251 kHz – Bellaire, MI

The second problem was apparently caused by inaccurate data in *Street Atlas.* The map for CXK on 251 kHz in Bellaire, Michigan, said it would be a few hundred feet from the end of a road in a small rural housing development. Unfortunately, the promised road simply petered out into a grassy meadow with no NDB in sight. Unwilling to "motocross" over obviously private property, we reluctantly gave up. But on the way out, we noticed a dirt road off the main highway that looked like it might head in the right direction. We were right. The two-track turned out to be the access road for a gravel quarry and we found CXK on top of a low bluff that overlooks the rather ugly mining operation.

Our adventure wasn't quite over though, as our borrowed car bogged down in loose sand as we tried to get out the way we came in. A lot of heaving, pushing and sweating ensued. But, in the end, we extricated ourselves and continued on.

AZ 371 kHz – Kalamazoo, Michigan

As we discovered the hard way, fixing an NDB's location on a map is one thing. Actually getting to it is another. Even when the map is accurate, you can pass right by some NDBs. Looking for our hometown beacon in Kalamazoo, Michigan, we kept driving by the indicated place without seeing any sign of it. The site was obviously hidden by tall trees, although we knew we were close, thanks to Russ' handheld GPS receiver (a very handy gadget on NDB hunts). We eventually drove down a two-track dirt road and discovered the source of AZ's 371 kHz signal on the edge of a small Christmas tree farm.

A note of caution for NDB tourists, at least here in the States: many locator outer marker NDBs like AZ are on private property. Unlike regular "homing" beacons at airports that are often owned by local agencies, LOMs are federal facilities. They are usually about five statute miles off the end of a runway. The NDB is there to guide pilots to the 75 MHz outer marker beacon for the airport's instrument landing system. The Federal Aviation Administration often leases private property to install them and that can make them hard to see well from public land. To find AZ we did something not recommended – we just drove onto the property. No one got upset. In fact, we didn't see anyone at all because we visited on a weekend when the business that owned the place was closed. But with hindsight it was not a very smart thing to do. The fact that there are no fences or gates should not be interpreted as an invitation to trespass. We should have simply

called the business later in the week and explained what we were about. That may well have resulted in an invitation to come out and take as many pictures as we wanted. That was exactly what happened a few weeks later when we drove up to Traverse City, Michigan. Its LOM – TV on 365 kHz – is due east of the airport in a heavily forested area. We easily found the beacon and its guyed vertical antenna sitting behind a farmhouse. With trepidation caused by some barking dogs, we knocked on the door and told the owner what we wanted. She was quite friendly and told us to look all we wanted but beware of the bull! She also told us about her dealings with the FAA over the years and volunteered that the Feds said they only wanted a short-term lease the last time they renewed because they thought NDBs wouldn't be around much longer.

TV 365 kHz – Traverse City, Michigan

The FAA's attitude toward NDB tourists seems to range from disbelief to outright hostility. The latter response is especially common in the wake of the attacks on New York and Washington on September 11th, 2001. FAA-operated navigation facilities now seem to be considered "high security" sites, although some are clearly visible from public roads, if you know what to look for. We did not seek permission from the FAA since all of their beacons we visited were on private property. If the owner of the property doesn't object to your visit, you shouldn't have any problems. Ironically, FAA-operated NDBs on *public* land, especially if it is federal property, are something else. In those cases, permission from the FAA would be needed and getting it isn't likely. So it is probably best to stay on the roadside or other area clearly open to the public and use binoculars or telephoto lenses, if necessary. Depending on the situation, even this could draw unwelcome attention from suspicious neighbors or law enforcement agencies, so discretion is advisable.

Absolutely never, under any circumstances, touch or disturb anything at any NDB you visit. This should be commonsense. However, some people just don't "get it," so dire warnings are usually posted to make the point crystal clear. This sign was hung on the attractive wooden hut that houses the transmitter for HLM on 233 kHz in Holland, Michigan. Unlike many of the beacons on our itinerary, it is in the open and can be easily approached. Amazingly, it is only a few feet from a paved bicycle path used by kids in the neighborhood with no fence to keep DX-ers and other nosy people away. Without the sign only a dedicated NDB hunter

or a navaid technician would recognize what it really is. The signs are there for a reason, though, and visitors are wise to keep their hands off.

HLM 233 kHz – Holland, Michigan

The federal government makes it easy not to get too close to its NDBs since most are surrounded by high fences topped by razor wire. Although you may find that some beacons operated by local governments are not fenced off, don't lose your sense of caution. Most of these are on airport property and trying to get close can lead to problems for the unwise. Crossing taxiways or runways is not only hazardous to your health and the safety of others, it will also annoy pilots and airport officials unnecessarily. You'll get a good lecture at best and an appointment with the local judge if they're really upset. Scaling fences that surround even some small airports is a violation of federal law and is, obviously, also a no-no. If you find that a beacon can't be seen from areas open to the public, ask the airport manager for permission to get closer. He or she may think your hobby is a little odd but may well escort you to a place where you can get a better look anyway. If they refuse, don't tempt fate by trying to find your own way. You can be sure your movements will be watched.

More often than we expected this turned out not to be a problem. A surprising number of NDBs at smaller airports in Michigan were easily seen at very close range without having to risk a ticket for trespassing. Very few "hide in plain sight" to the extent HLM does. But some come pretty close. HAI on 407 kHz in Three Rivers, Michigan, is only a few feet from the public drive to the airport office with nothing but good sense to keep the visitor from leaning on the telephone poles

CAD 269 kHz – Cadillac, Michigan

that hold up the antenna. And we found CAD in Cadillac (269 kHz) in a field near the decrepit hangar used by the local flying club. Again, no fence barred the way but we kept our distance. As the picture illustrates, we were able to get a good look without doing anything silly.

We went on our NDB hunts before "9-11" and did not feel it necessary to get an OK ahead of time from airport officials. The attacks led us to postpone plans to visit Michigan's other NDBs since the months immediately afterward didn't seem like a good time to show obvious but unexplained interest in aeronautical navigation aids. We do plan to eventually resume the tour – *after* securing written permission in advance.

Most DX-ers who make the effort to visit an NDB will probably want to take photographs of the transmitter and antenna. Digital cameras like the Kodak model we used make the process of sharing pictures electronically with fellow hobbyists easier. The downside is few if any have serious telephoto capability, something that will come in handy at beacons that can't be approached closely. We encountered this problem at BFA (263 kHz) in Boyne Falls, Michigan. This beacon is easily seen – at a distance – on the far side of the private airstrip owned by a large ski lodge and golf course. With no obvious way to get close other than walking across an active runway, we settled for a more panoramic shot than usual.

BFA 263 kHz – Boyne Falls, Michigan

Brandishing high-powered photographic equipment at airports, even in the relatively easygoing U.S., may lead to encounters with security personnel. This is even more likely if the photographer is in an area considered “off limits” to the public. Unless there is an airshow underway, security officers tend to view people wielding expensive cameras with suspicion, especially now. This is a problem that airliner enthusiasts and airplane “spotters” have encountered for years. Several “spotters” from the U.K. and the Netherlands wound up in a Greek jail in 2001 after meeting unsympathetic police who didn’t understand their hobby. That sort of draconian reaction isn’t likely to confront NDB hunters in the United States, assuming they haven’t violated any laws in the process of getting where they’re standing. Even so, it’s not a good idea to take unnecessary risks. Using a small camera, digital or not, will help you keep a low profile and may convince the authorities that your interest in their facilities is innocent, if “misguided”. If police or airport authorities approach you, honesty is always the best policy. As long as you are not in a restricted area, they will probably just tell you to move along. Do so immediately. You can always try again later when the people on duty may be more understanding (having a letter of permission from the airport manager would do a lot to promote such understanding).

Whipping out cameras at military airfields, even in the U.S., is generally unwise at all times – even from the public side of the fence - unless you have an official escort. One of the authors was accosted by USAF air police in New Mexico when he tried to photograph an antique airplane on public display! And that was way back in the relatively relaxed 1980’s. Military police will be even more suspicious if they also find you with radio equipment. Just ask dedicated “milcom” scanner enthusiasts who prefer to do their listening close to the action. Many NDBs on military bases will be difficult or impossible to see from public areas and getting permission from the base commander to visit these beacons is not likely in the current state of heightened security. Beacon enthusiasts are advised, however reluctantly, to pass them by. Some public airports also have military facilities that can cause increased sensitivity to unauthorized photography. This includes Air National Guard bases. Use extra caution when trying to photograph NDBs at such airports. Laws in other countries, including some in Western Europe, ban photography at airports with a military presence. Checking with fellow enthusiasts in the area ahead of time is a good idea.

There is another way to document a “visit” to an NDB, even one you never see, that probably won’t draw as much attention. That is to make an audio recording of the signal. All you need is a recorder and a portable receiver that includes longwave (190 to 530 kHz). The choice of recorder is a matter of personal taste and budget. We used a Sony MR-Z55 minidisc machine not much bigger than the palm of your hand that offers digital

quality in addition to its small size. A good quality cassette recorder would work just as well. If possible, connect the line level or “tape” output of the receiver to the line input of the recorder. This will eliminate extraneous noises that can be picked up by a microphone. As it happened, the Radio Shack DX-440 (Sangean ATS-803A) receiver we used doesn’t have a line output so we had to resort to a highly directional Audio Technica AT835b “shotgun” microphone temporarily “liberated” from work. Keeping the volume low and pointing the mic directly at the receiver’s speaker gave us very good results. What little background noise there was disappeared after running the audio through the filters in Cool Edit 2000 before conversion to MP3 files. Setting the receiver to AM mode will deliver the true tone broadcast by the NDB (usually 1020 Hz, more rarely 400 Hz, in the U.S.; the opposite is true in Canada). The recorded tone in CW or SSB mode will vary according to how well you’ve tuned in the beacon. Signal strength should not be a problem, even for relatively “deaf” receivers, once you get within a mile or two of the transmitter. Recording beacons can yield useful information about ident timing or unusual keying that could help others trying to log them.

We hope that others will try to visit at least a few of the NDBs in their area and document them visually or aurally for posterity. The sad truth is non-directional beacons are living on borrowed time. Fewer and fewer pilots in the U.S. bother to install an ADF receiver in their aircraft anymore, preferring to rely on VHF visual omni-range (VOR), LORAN and GPS systems for their navigation. An FAA official in Washington told one of the authors recently he thought all NDBs had already been decommissioned as obsolete! Continued operation of NDBs beyond 2005 is problematic, at least in North America. Visit and DX them while you can.

Notes:

1. http://www.alan.gale.clara.co.uk/ARarticle/tour.pdf
2. *Lowdown,* February 2002, pp 11-13
3. http://lwca.org/articles