

# **Mini-DXpeditions**

*Mark Connelly - WA1ION*

*19 JUL 1994*

Much has been written about large-scale DXpeditions involving several DXers, miles of wire, numerous receivers, and around-the-clock activities running for a weekend or longer. These are the grand efforts of which DX legend is made. Over the years, I've been involved in some big DXpeditions with guys like Neil Kazaross, Jean Burnell, and Bruce Conti. Valuable guidance for the serious DXpeditioner is given by Shawn Axelrod's fine discussion in the NRC DXpedition Handbook and by Nick Hall-Patch's compendium in Proceedings 1990.

Mini-DXpeditions, as the name implies, are smaller scale efforts not usually requiring an overnight stay or more than two operators. These shorter efforts can still be quite rewarding. Some of us have discovered worthwhile DXing locations not far from our homes or workplaces. Just getting a bit farther from pesty local stations or noisy power lines can help DXing considerably. Signal strengths are greater in locations having a view of the horizon not blocked by buildings, mountains, and other obstructions. Seaside locations are the best at medium and low frequencies because of both the high ground conductivity and a clear horizon. Mountaintop sites are good, especially on HF, VHF, and above. Flat, open farmland and lakeshores also have merit.

For medium-wave DXing, the simplest DXpedition can be taking some loggings on the car radio for an hour or so while parked at an advantageous site. Certain DXers' drivetime loggings (e. g. Marc DeLorenzo in the Hyundai) have become a regular feature in the DX magazines because some cannot DX effectively from RF-noise-riddled urban apartments having no space for outdoor antennas.

Besides the car radio (with an accurate clock), the only other equipment you might need on the simplest mini-DXpeditions is a logbook, reference materials, a pen, and a flashlight. Car radios are usually quite sensitive. Newer models are synthesizer tuned. This is an advantage because accurate frequency readout is provided, but channelized radios make tuning in foreign split stations more difficult. Some car radios are harder to tune onto weak-station frequencies because of the way the scanning functions work. Still, for many domestic DXers, the car radio will be the receiver of choice.

Unlike a full-blown DXpedition often requiring a substantial expenditure and time away from work and home duties, a mini-DXpedition can be "squeezed in" between leaving work and having dinner, or between dinner and bedtime. Sometimes these outings can be very impromptu, based upon hearing something unusual during a homeward commute. More than once, when I worked in downtown Boston, the sound of loud African heterodynes on the car radio around 5 PM EST (2200 UTC) in winter made me detour to the waterfront for an hour or so of listening before heading home.

### **Beyond the Car Radio ...**

The next step up from car radios on mini-DXpeditions is the portable receiver. Inside of a parked vehicle (the customary mini-DXpedition operating position), a portable receiver will only get powerhouse locals. The vehicle's metal surrounding the receiver eliminates everything else.

Few portable radios are sensitive enough on their built-in antennas even when operated outdoors, let alone inside a car. An external antenna, therefore, is necessary. The whip antenna that connects to the car radio is a high-impedance source that will not operate properly into the low-impedance external antenna inputs of portable receivers. If the car whip is to be used, it must be fed to a high-gain, high-Q tunable amplifier with an input impedance similar to the high impedance (LC tank / FET gate) of the car radio; such an amplifier would have a low-impedance (50 to 75 ohm typical) output. The "MWT" and "APT" regenerative tuners described in various NRC / IRCA reprints can provide this function.

A broadband active whip such as the MFJ 1024, powerable from the car's 12 VDC supply or from a battery pack, could be used for fast and easy scanning in areas not having strong local stations. The whip should be roof-mounted for best results.

A tunable antenna is always preferable, in terms of signal-to-noise and overload immunity, to a broadband active antenna. The MFJ 1024 can be modified for varactor-tuned operation: see the NRC / IRCA reprint about "RTU-1". You'll need to tune your active whip to prevent spurious responses at urban and suburban sites.

Most medium-wave DXers use loops and prefer them to any other compact antenna. Obviously, the ability to null and peak different stations and the overload immunity afforded by a high-Q tuned source make loop use desirable. A large air-core loop is probably too cumbersome for most mini-DXpeditions. Small ferrite loops like the Quantum, the SM-2, and the Radio West Loop are recommended. You've got to be able to tune the loop - located (usually) on the car's roof - while you tune the receiver inside the car. This can be done if you reach out the car window to adjust a loop positioned on the roof immediately adjacent to the window. A remotely-tuned loop (e.g. RTL-2) is better than a conventional loop because the only need to reach outside the car is to turn the loophead occasionally.

It is advisable to find a way to mount the loop base securely to the edge of the roof. More than once, a ferrite loop has been dislodged from a car roof by a gust of wind at a beach DXpedition site. This can be hazardous to your loop's health and to your sanity! Take a plastic bag to cover loops and active whips during rain; a rigid plastic radome-like cover might even be better.

Beyond the figure-of-eight pattern possible with loop usage, cardioid (single-null) patterns can be generated by phasing a remotely-tuned loop versus a remotely-tuned whip of comparable gain. Or, two remotely-tuned loops at a right angle can be phased. My RTL-2 and DCP-1 articles cover this in detail.

Up to now, I've been talking about antennas which can be mounted on the vehicle. Sometimes, longwires can be put up at a mini-DXpedition site. These can be phased for more directivity and run through tunable preamplifiers for higher gain and sharper tuning. Installation of such wires can produce different - sometimes better - DX than can be heard using car-mounted loops and active whips. One drawback is that wires must be rolled up at the end of the DXing session. Another disadvantage to wires is that if your site has substantial pedestrian, bicycle, or vehicular traffic, your wires may be pulled up by someone (accidentally or on purpose). Wires can attract the attention of police and can be a safety hazard. Antennas mounted on a vehicle do not slow you down when some circumstance - bad weather, police, bears, gangs of hooligans, or whatever - demands that you get away from the site quickly. Think about it before stringing out Beverages at a site whose potential dangers are not fully known. Here in the urbanized Northeast, few mini-DXpedition sites have enough room for big antennas anyway. You'll run into buildings, water, fences, other cars, powerlines, roads, or something else within a relatively short distance of most of the desirable shore sites.

I find that two insulated stranded wires of about 40 m / 130 ft. each, run at a right angle to each other and fed through an amplified phasing unit, give good results and can be rolled in quickly when it's time to leave. Still, if you're in the busy parking lot of a beach or seaside restaurant, forget the wires.

On the subject of receivers, there are many portables which will perform very well when operated with a good loop or tuned active whip. I have used the Sony ICF-2010 (2001D), the Realistic DX-440 (Sangean ATS-803A), and the Realistic DX-392 (Sangean ATS-818CS) with good results. The Sony has the edge in selectivity over the others because it was modified by Gerry Thomas for narrower filters. A regenerative loop (Kiwa or Martens) or a regenerative preselector such as MWT-3 can improve selectivity of portables to the point of being comparable to that of moderately-priced tabletop communications receivers.

The Realistic / Sangean models, while fairly insensitive on their built-in antennas, work like champs when hooked to a Quantum loop or to a regenerative wire / whip preselector. The DX-392 (ATS-818CS) has the advantage of a built-in cassette deck. You'll want to tape the excellent DX coming in at a good DXpedition site, especially during a wild aurora or other unusual conditions. Taping the jumping between a difficult medium-wave catch such as Lesotho - 1197 and an easy shortwave parallel like 5975 can make for interesting "show and tell" at the next DX get-together. Dealing with a separate cassette deck, patchcords, etc. can get a bit clumsy in the limited space / limited light environment of a car at a DX site. (Vans and campers give more operating room, but at a stiff price compared to compact cars.)

Portables often have "wimpy" external antenna jacks that are prone to wearing out much sooner than the rugged BNC and UHF (SO-239) connectors typically found on "serious" receivers. Think about modifying your portable's external antenna input connector for longer life.

When you want to "do it right", use a "real" communications receiver that is powerable from 12 VDC. I'm talking about the Drake, JRC, Icom, Yaesu, Lowe, and Kenwood radios customarily used for serious DXing. Obviously you will do much better on weak stations and foreign splits by using such a receiver instead of a compromise portable. The drawbacks are increased power consumption and the added room such a receiver takes up. The new battery-operable Drake SW8 promises to bridge the performance gap between portables such as the Sony ICF-2010 and tabletop receivers such as the R8 and NRD-535.

### Other hints

Start the car up about every 30 to 60 minutes if you're running receivers, preamplifiers, etc. from its battery. Run the engine for 5 or more minutes each time. In winter, you'll want to do this to get some heat as well as to recharge the battery. Use a separate flashlight or lantern rather than a light drawing power from the car battery. I learned this the hard way a few years ago when I "croaked" the car battery during a cold winter outing to Swampscott, MA. It took more than an hour to find someone for a jump-start. You don't want this to happen!

Do dry runs of mini-DXpeditioning from the driveway at your home location to figure out optimal placements of receivers, tapedecks, books, lanterns, antenna tuners, patchcables / antenna lead-ins, etc. Determine the most efficient, most comfortable set-up. Also, at home, if you decide you need another book, tool, adapter, or patchcable, it's right there inside your house or apartment. If you left a necessary item at home and you're parked out on a pier more than an hour's drive away, it's "tough luck Charlie".

Take back-up batteries and a small back-up receiver (e. g. Realistic DX-380) to prevent dead batteries or a receiver malfunction from wrecking the whole effort. If your travel time to the site from your normal home (or work) location is over an hour, this is especially important.

### Mark's Mini-DXpedition Items: A Check-List

NOTES: This list is written with single- or dual-operator car-based medium-wave mini-DXpeditions in the US and Canada in mind. It can be adapted for operation on other bands, other locales, etc. One to five hours of actual DXing time is typical. Items - such as tools, cables, and books - that are not sensitive to heat and cold can be stored in the car on a permanent basis.

#### **\*\*\* BARE ESSENTIALS \*\*\***

- \* portable receiver (e. g. Sony ICF-2010) with batteries and / or car cigarette lighter adapter
- \* ferrite loop (RTL-2 base with Quantum head; or equivalent)
- \* whip with BNC plug (for use of RTL-2 as active whip)
- \* regenerative preselector / remote loop controller (MWT-3)
- \* cables to connect RTL-2 to MWT-3, MWT-3 to receiver
- \* kit of between-series coaxial adapters (BNC, UHF, RCA, N, SMA, F, stereo & mono phone & mini-phone)
- \* 12 VDC power cord for loop / preselector, etc.
- \* logbook, hit lists
- \* World Radio-TV Handbook
- \* NRC Domestic Log
- \* flashlight or lantern
- \* pens, pencils
- \* rolls of wire (two about 40 m / 130 ft.; one or more over 250 m / 820 ft.)
- \* toolbox with common tools (screwdrivers, socket set, knives, cutters, pliers, wrenches, 12 V soldering pencil, solder, electrical tape, hammer, etc.)
- \* clock or watch set to UTC (GMT)
- \* single lighter plug to 2 (or more) jack car power adapter
- \* extra batteries as deemed necessary

- \* clip leads (alligator, 'Easy Hooks', etc.)
- \* rugged storage case(s) for the above items

**\*\*\* ADDITIONAL ITEMS WELL WORTH HAVING \*\*\***

- \* small portable cassette recorder, blank cassettes
- \* amplified two-wire phasing unit (e. g. MWDX-5)
- \* second RTL-2 loop and a DCP-1 controller for loop-vs.-loop, loop-vs.-whip cardioid pattern generation
- \* small back-up receiver (e. g. Realistic DX-380) (should also have digital readout)
- \* 2-meter ham transceiver, CB, or cellular phone for emergency communication
- \* pocket digital multimeter
- \* batteries, interconnecting cables (power/AF/RF) as required for the above
- \* headphones
- \* recent copies of DX News, DX Monitor, and other hobby bulletins
- \* supplemental station lists (EBU List, Newfoundland DXpedition Logs, LF Beacon Guide, etc.)
- \* NRC directional pattern book
- \* compass
- \* sunrise / sunset maps or tables
- \* great-circle map or bearing / distance tables that are fairly accurate for the DXpedition QTH
- \* US / Canada road atlas
- \* world atlas
- \* topographical map of local area, aeronautical charts showing tower sites and beacon freq's
- \* Spanish / English and other language dictionaries as needed
- \* lunchbox with sandwiches, snacks, soda / fruit juice; thermos with coffee or tea
- \* bow & arrows, fishing line, thin & thick nylon rope for launching antennas into trees
- \* insect repellent for summer DXpeditions
- \* matching / noise-reducing transformers for wire antennas

**\*\*\* WHEN YOU REALLY WANT TO GO NUTS \*\*\***

- \* separate deep-cycle (marine-type) battery
- \* communications receiver (e. g. Drake R8)
- \* spare fuses for communications receiver
- \* VCR for up to 6 hours of taping DX audio or for experiments with direct taping of RF
- \* 12 VDC to 115 VAC converter if needed; AC extension cords / power strips / adapters
- \* laptop computer for checking previous logs and geographical data, and for taking notes
- \* ground rods, termination resistors for Beverages
- \* special protective clothing, boots, gloves as required for wet / rough terrain, harsh weather
- \* folding tables, chairs for outdoor set-ups

**Business / Vacation Trip Mini-DXpeditions**

When you have to travel by air to get to your destination, instead of driving your own car, you must be more selective in terms of items taken. This is especially so if DXing is to be a spare-time pursuit rather than the focus of the trip. The check-list can be customized accordingly. A radio, a small loop, the logbook, and the WRTH might be all you can pack ... Better that than nothing at all.

For foreign travel, power adapters may be required. Having receipts proving where equipment was bought is advisable. Bring magazine or newspaper articles explaining the hobby. This can help to prove that you aren't a spy or smuggler. Think about customs restrictions at both ends of your trip. Talk to those who have visited a given area. Find out what DX is like there and if there are any DXers living nearby. Learn about local laws, possibly-useful sites, and any special problems (weather, insect pests, high crime, etc.).

### **Conclusions**

Really interesting DX can often be heard in a few hours at a choice location within a reasonable drive of home. On DXpeditions to Granite Pier in Rockport, MA and other coastal sites in New England and eastern Canada, upwards of 30 countries have been logged on medium-wave in a 2 or 3 hour stretch starting at sunset. Similar results have been obtained by DXers in Florida during short sessions. Brief pre-dawn operations from the Pacific Northwest have resulted in rapid-fire logs of stations from Australia, New Zealand, Japan, and many other countries.

One thing mini-DXpeditions prove is that it doesn't take a huge investment of time or money to "spice up" your DX life.