

Roam

By Thomas. P. Sullivan, W1AUV

Microwave enthusiasts look forward each year to August and September and the two weekend ARRL 10 GHz and up Cumulative Contest. Its participants spend all year getting ready by enhancing old gear, building new gear and fixing what broke the last time. They make plans for next year and evaluate what they did right and wrong. Everyone has a different goal. Some operate the contest to test what they build and others try to make a longer distance QSO than they did the last year. The competition is, from my perspective, friendly but serious. We help each other when we can because nobody wants to see anyone lose a contact however, I think we all want to improve our score from last year and maybe even have some bragging rights.

There are many possible strategies when operating in the 10 GHz and up Cumulative Contest. If you can find a good mountaintop in a strategic location, devoid of trees or tall vegetation, you can set up your gear and spend the day operating in one spot. Many hams will affirm that, if you stay alert after the sun goes down, you can make some interesting long distance contacts using enhancements.

Besides operating from a mountaintop there are many people who operate from home stations for the entire contest. It's nice if you have a home station that is well-suited for microwave communications. For the rest of us we have to accept portable operation.

I have discovered that while there are certain advantages to staying in one spot for the contest, there are distinct advantages if you move around. As you know, the rules state that if you move 10 miles (16 km) you can start all over making contacts with people you may have previously contacted. When the activity level slows down during the contest, I have waited hours to talk to someone new. When we hear on the liaison frequency that someone will be in a new location at such and such a time, we wait eagerly. When they send out a call that they are setting up at the new location we all wait like vicious carnivores for our chance to pounce.

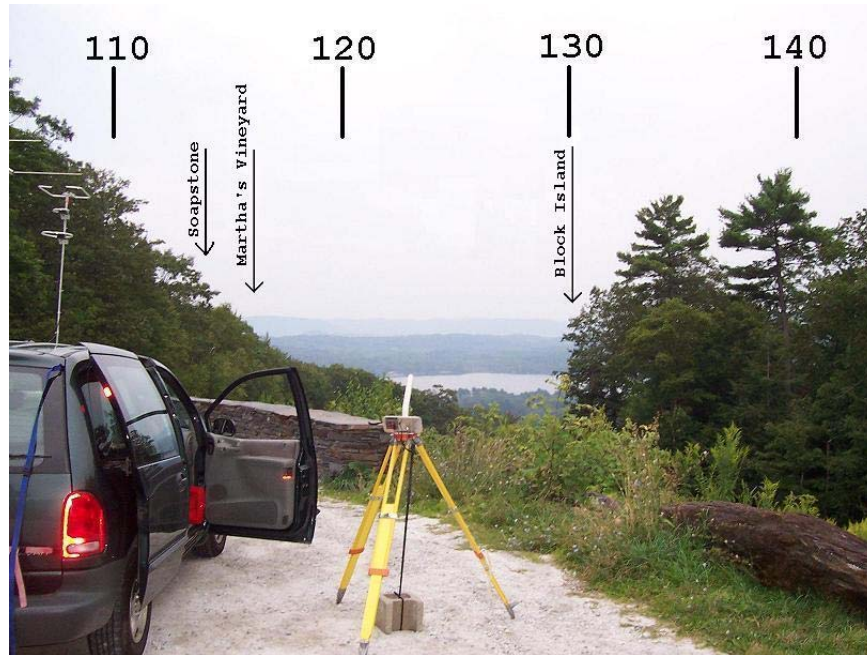


Figure 1 FN32hi - Olivia's Overlook, Stockbridge MA

The one-mountaintop-strategy has a wrinkle: it is getting harder to find a mountain to use. Here in New England, many of the good mountains are becoming covered in trees which attenuate or altogether block microwave signals. Many mountains are also crowded with non-ham people sometimes making it hard to operate; hard because you have to be careful not to point your antenna at a crowd of bird watchers (for example) and also because you are more likely to have to answer questions about what kind of activity you are engaged in. I don't mind explaining what I am doing, for the most part, as it helps to increase awareness of and interest in ham radio. I have heard some hams complain about this; however, let's face it, tripods with parabolic reflectors mounted on them and Yagis on short, guyed masts along with wires, batteries and coax cable surely warrants an explanation- but filling the role of tour-guide can slow you down.

Another problem with mountains is that some, like Mt. Greylock in Berkshire County Massachusetts, have permit requirements in order to use the very top of the mountain for our ham activities (and I understand there is a steep fee). You need to arrange these ahead of time which means that you have to be somewhere at a particular time which I find difficult to integrate with my usual and somewhat spontaneous microwave plans.

Some mountains have strict gate times. You may want to get up on top by sunrise but the gate may not open until 8 or 9 AM. Some of them close early or at least early enough that you could become trapped. Some mountains are hard to get up and may even require a hike or a ride on a chair lift to get to the good spot(s). Even the bare minimum of equipment is heavy and/or cumbersome to transport.

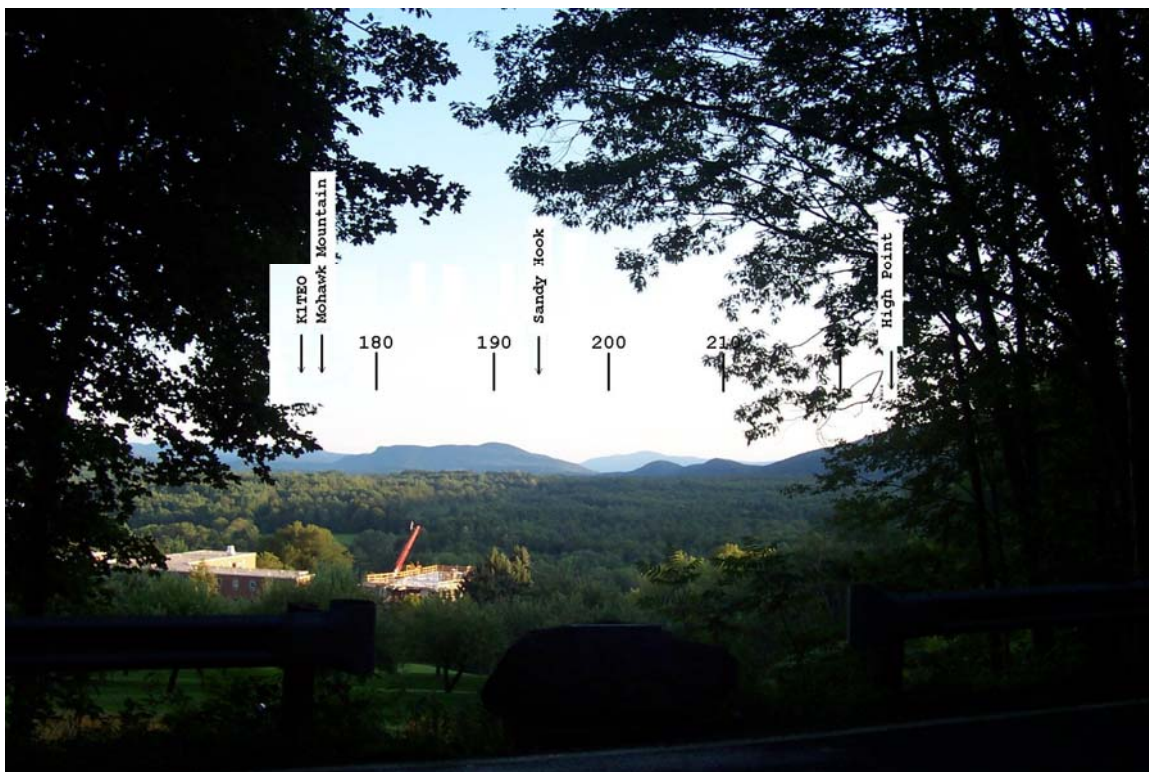


Figure 2 FN32ii - behind Shadowbrook in Stockbridge MA

So I have learned to try and take the path “less travelled.” Yes I still visit mountaintops but I have discovered new locations to use. These locations are sometimes just a spot on the side of a road or a highway. They can also be scenic rest stops on Interstates. I use these new locations as filler between what might be called ‘major locations’. These filler locations usually have good (i.e. fast) access but somewhat limited visibility which is why they usually don’t get a lot of attention. I choose to use them because they are fast and because of their views towards other popular or mountain locations where other hams may be.

These locations can be ‘lucrative’ points-wise even if only one or two other sites are ‘visible’. For example, Olivia’s Overlook near Stockbridge MA (Figure 1) provides a scenic view of Stockbridge Bowl (a lake) and serves as access to some hiking trails. It only has 15-18 degrees of clear horizon. But within that small window lies a clear shot at both Martha’s Vineyard and Block Island. There are usually two or three hams operating on one or the other island. I remember that on one weekend during the contest there were two or three microwave equipped hams on both islands. With the points distance in kilometers at 236 and 192 respectively they are not long haul contacts like we see with our fellow California hams - but I was able to collect a lot of points when I stopped there. This location has easy access and I can set up my equipment fast. I have been in and out of this location inside of 30-45 minutes on my way home from one or two sites in New York State. The points I have earned for this stop would be like making one very long distance contact.



Figure 3 FN32qg - Scenic Rest stop on I-91

There is another location just below Olivia's Overlook about a half mile away. It faces more to the south and I have made several very good contacts from there too (FN32ii04 – See Figure 2). I have to operate this site from across the road from the opening in the trees but again, I can pull in, set up, operate, tear down and get out fast.

Another site is a scenic rest stop along I-91 near Holyoke MA (Figure 3). From there I have worked Mount Wachusett (near Leominster MA), Martha's Vineyard, Westboro Water Tower and Block Island. I just pull in the south bound rest stop, do my thing and leave.

This new strategy has worked very well for me over the last few years. The general increase in my score since I have begun participating in the microwave contest has certainly reflected this. Over the past few years I have cataloged these new sites. I have taken photographs of the 'view' they provide and I have superimposed the degree headings right onto the photos along with the 6 and 8 digit grid square information. I have in some cases stitched individual photos together to create one panoramic photo. I post these on my web site: <http://tpsully.googlepages.com>.

Roam

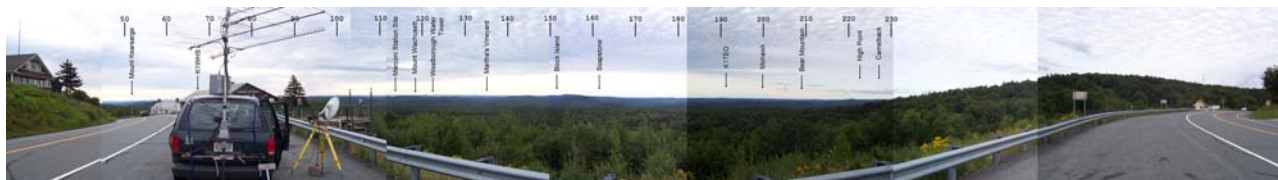
After the contest a couple of years ago I realized that I needed a tool to help me in my contest planning. I had collected a lot of the data but I had no way to analyze it. What I wanted was a way to rank sites based on distance and visibility to other locations. I had a lot of information but no easy way to pull it all together. This led me to develop a computer program I call Roam¹.

Roam is a PC command line program that reads a text file as input and writes a text file as output. The input file is a list of lines containing comma separated values. Each line has four fields. The first field is location. The locations can be entered as 2, 4, 6 or 8 digit Maidenhead although 6 or 8 make sense for the microwave contest. The second field contains the degree heading of the left-most edge of the horizon or window. The third field contains the degree heading of the right-most edge of the horizon or window. The last field is a text description of the location (with no commas). A sample input file is shown in Appendix A.



Figure 4 FN22xp - John Boyd Thatcher State Park Voorheesville, NY
(If you go here, call the park Superintendent first and let him know you'll be there.)

Roam reads the input file and processes it to calculate the distance and bearing between each of the location combinations. But this isn't just batch processing of distance and bearing although it could be used for that. **By default, Roam only includes in the output those locations that are 'visible' to each other.** This means that if one mountain location has no clear path to the south then the distance and bearing to a mountain to the south is not sent to the output file even if the mountain to the south has a clear shot to the mountain to the north.



Using Roam

The possible command line options for ROAM are shown below:

ROAM V1.01 by W1AUV 2008

SYNTAX: ROAM Inputfile Outputfile [[/r][/e][/d#]

/r - Raw output (no valid path checking)
 /e - Echo to console window
 /d# - Maximum distance to display
 e.g. /d240 (maximum distance 240 km)

The command line option /r for raw output will override the program's normal behavior and will compute the distance and bearing to all locations and write it to the output file regardless of visibility. This option is provided for hams who wish to generate tables of distance and bearing. The optional /e or echo option writes the computed output to the screen as well as the output file. The last command line option is /d or maximum Distance. If the maximum practical distance capability for your equipment (based on your experience) is 400 km then you may want to use the /d switch to set the maximum distance at 400km (or perhaps a little more if you are optimistic).

A sample run could look like this:

```
>roam sample.txt out.txt
```

ROAM V1.01 by W1AUV 2008

Read 20 lines from sample.txt.

There were 42 clear paths out of 380 possible

The results of this sample run on the input file in Appendix A are shown in Appendix B.

Ranking

A way to rank sites is by how many other sites are ‘visible’ to them. You can also use a weighting based on visibility and distance between locations. This can just be by inspecting what good filler sites are close to or between other major sites. You can create a new input file based on the posted plans for a given weekend. Use this and ROAM as a part of your decision-making process to help maximize your score.

Future Improvements

One thing that Roam does not take into account is terrain. I have considered adding this using SRTM data. It might be a fair amount of work though and other programs do a nice job of this already². I think that most people already know if a location that they go to has a clear path to another location. Still, elevation data may be something to look at.

Summary

I hope that you will try Roam and hope that you find it useful in planning for your summer microwave contest. Remember, the next time you are out in the contest (or at other times), catalog locations like rest stops and parking lots that have a nice horizon...even a narrow view. Record the location in Maidenhead and the left and right clear views in degrees. If you can, take a picture or pictures and put the degree headings on the photos. If you are really generous, post them for others. I think this will help to get more microwave operators to move to new and potentially prosperous locations.

Appendix A - Sample input file

FN31it47,340,20,Mohawk Mountain North Site
FN31it47,170,210,Mohawk Mountain South Site
FN32hi94,115,135,Olivia's Overlook
FN32ii03,170,225,Behind Shadowbrook
FN32jn42,180,230,Greylock Visitor's Center
FN32jp92,260,295,Greylock Loop Road Vista
FN32kp02,35,220,Greylock Overlook
FN32ou44,50,230,Hogback
FN32qg51,60,145,Rest Stop Holyoke 91 South
FN33kd47,45,100,Equinox - Bottom of Saddle East
FN33kd47,260,315,Equinox - Bottom of Saddle West
FN33kd48,80,220,Equinox - Top of the Saddle
FN33kd59,135,340,Equinox - South Edge of Hotel Porch
FN33kd59,350,60,Equinox - NE corner of parking lot
FN41ee,0,360,Block Island Site 1
FN41ni93,0,360,Gay Head Lighthouse Martha's Vineyard
FN42bl37,0,360,Mount Wachusett
FN42fg08,173,355,Westborough Water Tower
FN43bj60,90,245,Mount Kearsarge
FN44ig35,90,270,Mount Washington NH

Appendix B - Sample Output File

ROAM V1.01 by W1AUV 2008

Source	Target	Distance (km)	Bearing	Reverse	Description
FN3lit47	FN32ii03	58.3	357.3	177.3	Mohawk Mountain North Site to Behind Shadowbrook
FN3lit47	FN32jn42	81.2	4.8	184.9	Mohawk Mountain North Site to Greylock Visitor's Center
FN3lit47	FN32kp02	90.8	6.9	187.0	Mohawk Mountain North Site to Greylock Overlook
FN3lit47	FN32ou44	121.4	19.6	199.9	Mohawk Mountain North Site to Hogback
FN3lit47	FN33kd48	149.1	5.2	185.3	Mohawk Mountain North Site to Equinox - Top of the Saddle
FN3lit47	FN33kd59	149.6	5.4	185.6	Mohawk Mountain North Site to Equinox - South Edge of Hotel Porch
FN32hi94	FN4lee	192.3	131.8	312.9	Olivia's Overlook to Block Island Site 1
FN32hi94	FN4lni93	235.6	117.5	299.2	Olivia's Overlook to Gay Head Lighthouse Martha's Vineyard
FN32ii03	FN3lit47	58.3	177.3	357.3	Behind Shadowbrook to Mohawk Mountain North Site
FN32jn42	FN3lit47	81.2	184.9	4.8	Greylock Visitor's Center to Mohawk Mountain North Site
FN32kp02	FN3lit47	90.8	187.0	6.9	Greylock Overlook to Mohawk Mountain North Site
FN32kp02	FN4lee	205.1	141.2	322.2	Greylock Overlook to Block Island Site 1
FN32kp02	FN4lni93	239.8	125.9	307.5	Greylock Overlook to Gay Head Lighthouse Martha's Vineyard
FN32kp02	FN42bl37	105.9	98.4	279.3	Greylock Overlook to Mount Wachusett
FN32kp02	FN42fg08	135.9	106.1	287.2	Greylock Overlook to Westborough Water Tower
FN32kp02	FN43bj60	134.2	51.6	232.5	Greylock Overlook to Mount Kearsarge
FN32kp02	FN44ig35	235.9	38.8	220.1	Greylock Overlook to Mount Washington NH
FN32ou44	FN3lit47	121.4	199.9	19.6	Hogback to Mohawk Mountain North Site
FN32ou44	FN4lee	208.6	152.0	332.8	Hogback to Block Island Site 1
FN32ou44	FN4lni93	232.6	135.3	316.6	Hogback to Gay Head Lighthouse Martha's Vineyard
FN32ou44	FN42bl37	84.6	118.2	298.8	Hogback to Mount Wachusett
FN32ou44	FN42fg08	118.0	121.9	302.7	Hogback to Westborough Water Tower
FN32ou44	FN43bj60	95.7	52.1	232.7	Hogback to Mount Kearsarge
FN32qg51	FN4lee	144.7	144.9	325.5	Rest Stop Holyoke 91 South to Block Island Site 1
FN32qg51	FN4lni93	179.2	123.7	304.9	Rest Stop Holyoke 91 South to Gay Head Lighthouse Martha's Vineyard
FN32qg51	FN42bl37	65.7	66.5	246.9	Rest Stop Holyoke 91 South to Mount Wachusett
FN32qg51	FN42fg08	86.0	87.5	268.2	Rest Stop Holyoke 91 South to Westborough Water Tower
FN33kd47	FN44ig35	192.3	49.1	230.4	Equinox - Bottom of Saddle East to Mount Washington NH
FN33kd48	FN3lit47	149.1	185.3	5.2	Equinox - Top of the Saddle to Mohawk Mountain North Site
FN33kd48	FN4lee	251.7	150.0	331.0	Equinox - Top of the Saddle to Block Island Site 1
FN33kd48	FN4lni93	276.1	136.1	317.7	Equinox - Top of the Saddle to Gay Head Lighthouse Martha's Vineyard
FN33kd48	FN42bl37	125.9	126.0	306.8	Equinox - Top of the Saddle to Mount Wachusett
FN33kd48	FN42fg08	159.8	127.0	308.1	Equinox - Top of the Saddle to Westborough Water Tower
FN33kd59	FN3lit47	149.6	185.6	5.4	Equinox - South Edge of Hotel Porch to Mohawk Mountain North Site
FN33kd59	FN4lee	251.8	150.2	331.2	Equinox - South Edge of Hotel Porch to Block Island Site 1
FN33kd59	FN4lni93	275.9	136.3	317.8	Equinox - South Edge of Hotel Porch to Gay Head Lighthouse Martha's Vineyard
FN33kd59	FN44ig35	191.2	49.2	230.5	Equinox - NE corner of parking lot to Mount Washington NH
FN4lee	FN32hi94	191.4	314.0	132.9	Block Island Site 1 to Olivia's Overlook
FN4lee	FN32kp02	204.9	323.2	142.2	Block Island Site 1 to Greylock Overlook
FN4lee	FN32ou44	209.1	333.8	153.0	Block Island Site 1 to Hogback
FN4lee	FN33kd48	252.1	331.9	150.9	Block Island Site 1 to Equinox - Top of the Saddle
FN4lee	FN33kd59	252.1	332.0	151.1	Block Island Site 1 to Equinox - South Edge of Hotel Porch
FN4lee	FN4lni93	71.9	73.6	254.2	Block Island Site 1 to Gay Head Lighthouse Martha's Vineyard
FN4lee	FN42bl37	147.8	352.8	172.7	Block Island Site 1 to Mount Wachusett
FN4lee	FN42fg08	124.1	3.2	183.2	Block Island Site 1 to Westborough Water Tower
FN4lee	FN43bj60	245.6	356.2	176.1	Block Island Site 1 to Mount Kearsarge
FN4lee	FN44ig35	345.8	4.7	185.0	Block Island Site 1 to Mount Washington NH
FN4lni93	FN32hi94	235.6	299.2	117.5	Gay Head Lighthouse Martha's Vineyard to Olivia's Overlook
FN4lni93	FN32kp02	239.8	307.5	125.9	Gay Head Lighthouse Martha's Vineyard to Greylock Overlook
FN4lni93	FN32ou44	232.6	316.6	135.3	Gay Head Lighthouse Martha's Vineyard to Hogback

FN41ni93, FN32qg51, Holyoke 91 South	179.2, 304.9, 123.7,	Gay Head Lighthouse Martha's Vineyard to Rest Stop
FN41ni93, FN33kd48, Top of the Saddle	276.1, 317.7, 136.1,	Gay Head Lighthouse Martha's Vineyard to Equinox -
FN41ni93, FN33kd59, South Edge of Hotel Porch	275.9, 317.8, 136.3,	Gay Head Lighthouse Martha's Vineyard to Equinox -
FN41ni93, FN41lee, Site 1	68.3, 255.1, 74.6,	Gay Head Lighthouse Martha's Vineyard to Block Island
FN41ni93, FN42bl37, Wachusett	153.7, 326.0, 145.3,	Gay Head Lighthouse Martha's Vineyard to Mount
FN41ni93, FN43bj60, Kearsarge	240.5, 339.9, 159.2,	Gay Head Lighthouse Martha's Vineyard to Mount
FN41ni93, FN44ig35, Washington NH	326.9, 353.5, 173.2,	Gay Head Lighthouse Martha's Vineyard to Mount
FN42bl37, FN32kp02,	105.9, 279.3, 98.4,	Mount Wachusett to Greylock Overlook
FN42bl37, FN32ou44,	84.6, 298.8, 118.2,	Mount Wachusett to Hogback
FN42bl37, FN32qg51,	65.7, 246.9, 66.5,	Mount Wachusett to Rest Stop Holyoke 91 South
FN42bl37, FN33kd48,	125.9, 306.8, 126.0,	Mount Wachusett to Equinox - Top of the Saddle
FN42bl37, FN41lee,	146.1, 171.4, 351.5,	Mount Wachusett to Block Island Site 1
FN42bl37, FN41ni93, Vineyard	153.7, 145.3, 326.0,	Mount Wachusett to Gay Head Lighthouse Martha's
FN42bl37, FN42fg08,	34.0, 131.8, 312.0,	Mount Wachusett to Westborough Water Tower
FN42bl37, FN43bj60,	98.5, 1.2, 181.2,	Mount Wachusett to Mount Kearsarge
FN42bl37, FN44ig35,	203.5, 13.2, 193.6,	Mount Wachusett to Mount Washington NH
FN42fg08, FN32kp02,	135.9, 287.2, 106.1,	Westborough Water Tower to Greylock Overlook
FN42fg08, FN32ou44,	118.0, 302.7, 121.9,	Westborough Water Tower to Hogback
FN42fg08, FN32qg51,	86.0, 268.2, 87.5,	Westborough Water Tower to Rest Stop Holyoke 91 South
FN42fg08, FN33kd48, Saddle	159.8, 308.1, 127.0,	Westborough Water Tower to Equinox - Top of the
FN42fg08, FN41lee,	121.9, 181.8, 1.8,	Westborough Water Tower to Block Island Site 1
FN42fg08, FN42bl37,	34.0, 312.0, 131.8,	Westborough Water Tower to Mount Wachusett
FN42fg08, FN43bj60,	123.4, 349.3, 169.1,	Westborough Water Tower to Mount Kearsarge
FN43bj60, FN32kp02,	134.2, 232.5, 51.6,	Mount Kearsarge to Greylock Overlook
FN43bj60, FN32ou44,	95.7, 232.7, 52.1,	Mount Kearsarge to Hogback
FN43bj60, FN41lee,	243.8, 175.3, 355.5,	Mount Kearsarge to Block Island Site 1
FN43bj60, FN41ni93, Vineyard	240.5, 159.2, 339.9,	Mount Kearsarge to Gay Head Lighthouse Martha's
FN43bj60, FN42bl37,	98.5, 181.2, 1.2,	Mount Kearsarge to Mount Wachusett
FN43bj60, FN42fg08,	123.4, 169.1, 349.3,	Mount Kearsarge to Westborough Water Tower
FN44ig35, FN32kp02,	235.9, 220.1, 38.8,	Mount Washington NH to Greylock Overlook
FN44ig35, FN33kd47, East	192.3, 230.4, 49.1,	Mount Washington NH to Equinox - Bottom of Saddle
FN44ig35, FN33kd59, lot	191.2, 230.5, 49.2,	Mount Washington NH to Equinox - NE corner of parking
FN44ig35, FN41lee,	343.4, 184.5, 4.3,	Mount Washington NH to Block Island Site 1
FN44ig35, FN41ni93, Vineyard	326.9, 173.2, 353.5,	Mount Washington NH to Gay Head Lighthouse Martha's
FN44ig35, FN42bl37,	203.5, 193.6, 13.2,	Mount Washington NH to Mount Wachusett

¹ To download Roam go to <http://tpsully.googlepages.com>

² For example, Radio Mobile. Go to <http://www.cplus.org/rmw/english1.html>