10 GHz (Microwave), up North

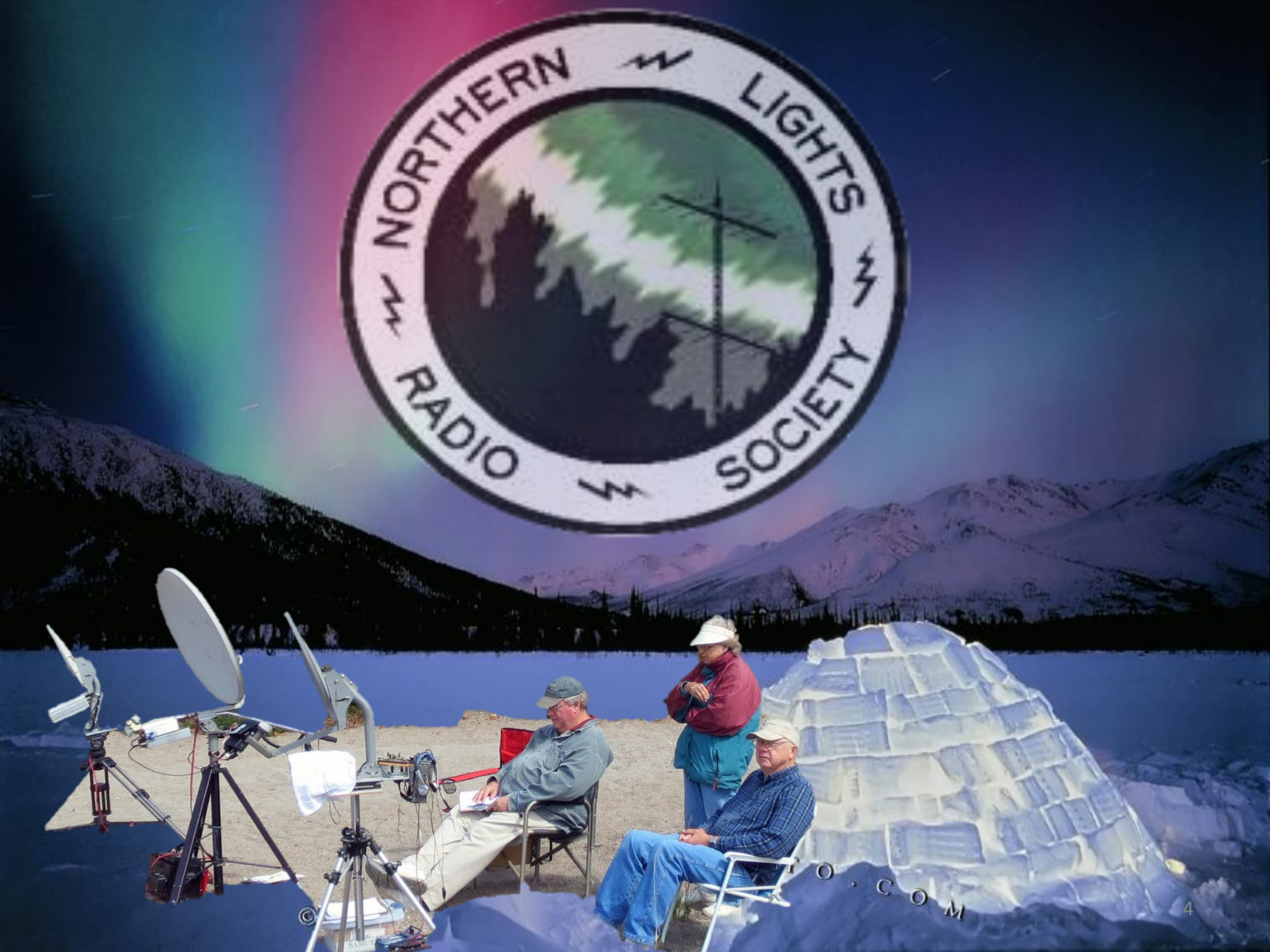
Part #1
Promotion

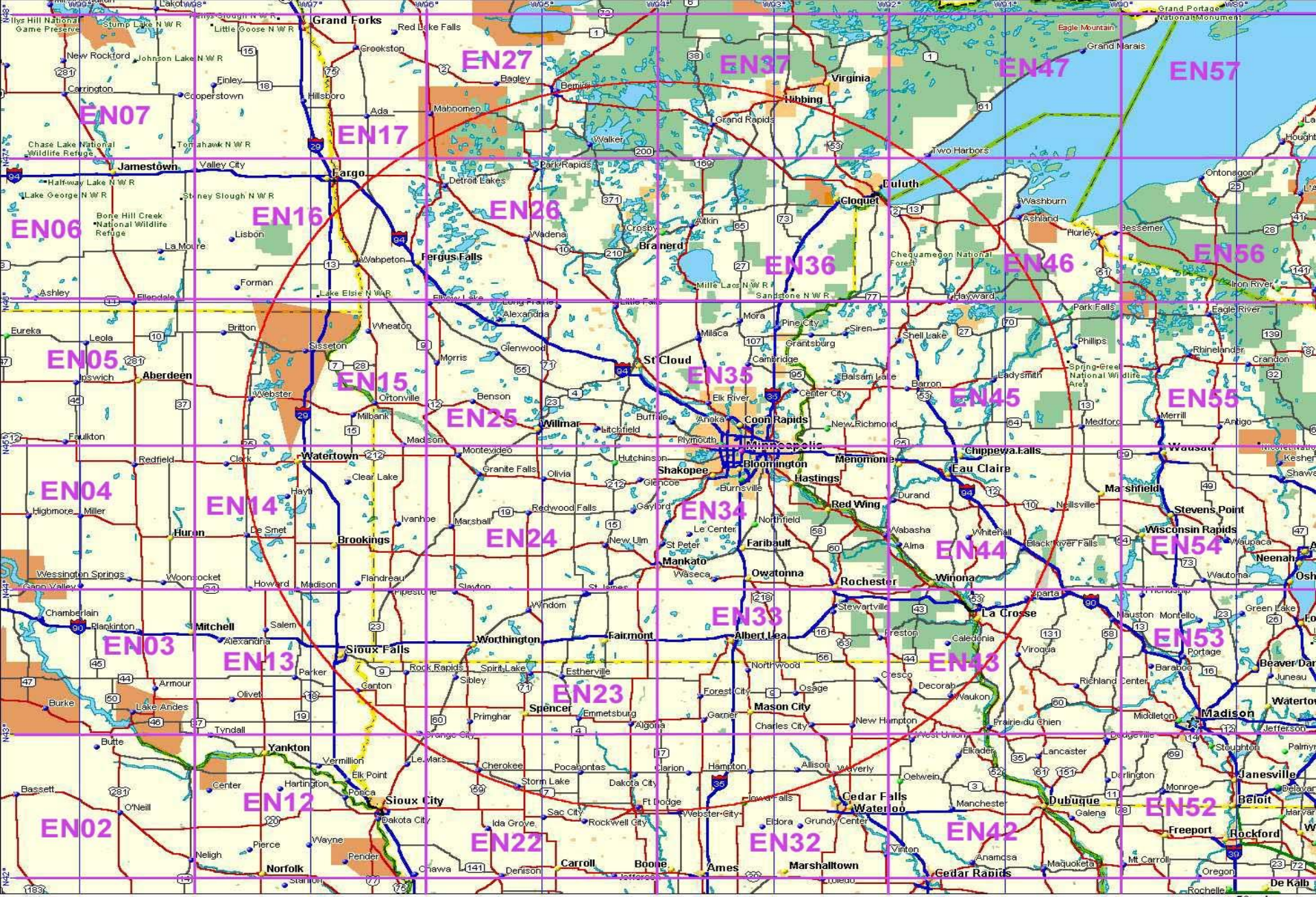
Part #2
Activities

Part #3
Planning

Parts 2 & 3 Presented at the NTMS Microwave Mini-conference on Nov. 9th 2013 by Jim Froemke K0MHC/rover

10 GHz DXpedition to the Great Lakes


NORTHERN LIGHTS
RADIO SOCIETY



Scale: 1 : 3,200,000 Zoom Level: 6-0 Datum: WGS84 Map Rotation: 0° Magnetic Declination: 2.5°E

Northern Lights Radio Society – Service Area (175 mile circle)

NLRS Introduction

- Established 16* years with ~70 members
  - Wisconsin Badger & Chippewa Valley Contesters spin-offs
- Spans VHF, UHF and Microwave bands
- Upper Midwest weak signal radio operators
  - Twin Cities of Minneapolis and St. Paul, Minnesota
  - North & South Dakota, Iowa, Wisconsin & Manitoba, Ca.
- Focused on “getting-on-the-air”
  - Privately owned beacons or repeaters
- History of “Elmering” new, HF and FMers
- Broad membership demographics

NLRS Demographics

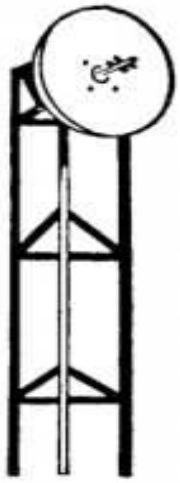
Current NLRS Challenges

- Spanning VHF, UHF and Microwave bands
- Recruiting new members
- Retaining older members
- Attracting more Rovers
- Stimulating local VHF/UHF activity
- More emphasis on the “& Up” in 2014
  - 10 GHz & Up

On-the-air µW Opportunities

"Activity breeds Activity!"

- **Calendar:**
  - **Jan., June, August & Sept. ARRL VHF/UHF/SHF Contests**
  - **June Field Day – µW On-the-Air Demonstrations**
  - **Spring & Fall - µW Sprints**
  - ***Spring - SBMS 2 GHz & Up***
  - ***August & September 10 GHz & Up***
  - **Fall, Winter & Spring – Snow/Sleet Scatter**
  - **Spring, Summer and Fall – Rain/Sleet Scatter**
  - **Monthly* optimum EME activity days**
  - **Monthly µW Activity Day(s)**
  - **Year round - Local/Regional Distance Expeditions**
  - **Year round - VUCC & Reverse VUCC Expeditions**



SAN BERNARDINO MICROWAVE SOCIETY, Incorporated

FOUNDED IN 1955

A NON-PROFIT AMATEUR TECHNICAL ORGANIZATION DEDICATED TO THE ADVANCEMENT OF COMMUNICATIONS ABOVE 1000 MC.

2013 SBMS 2 GHz and Up Contest (edited)

Northern Lights Radio Society 1st place with 18,644 pts. 9 logs.
With contacts on 2 and 3 GHz in addition to the ones on 10 GHz.

The NLRS continues to out pace the rest of the clubs in getting people out for the contest.

Congratulations to NLRS for another year of winning the contest.
--Bill Burns WA6QYR

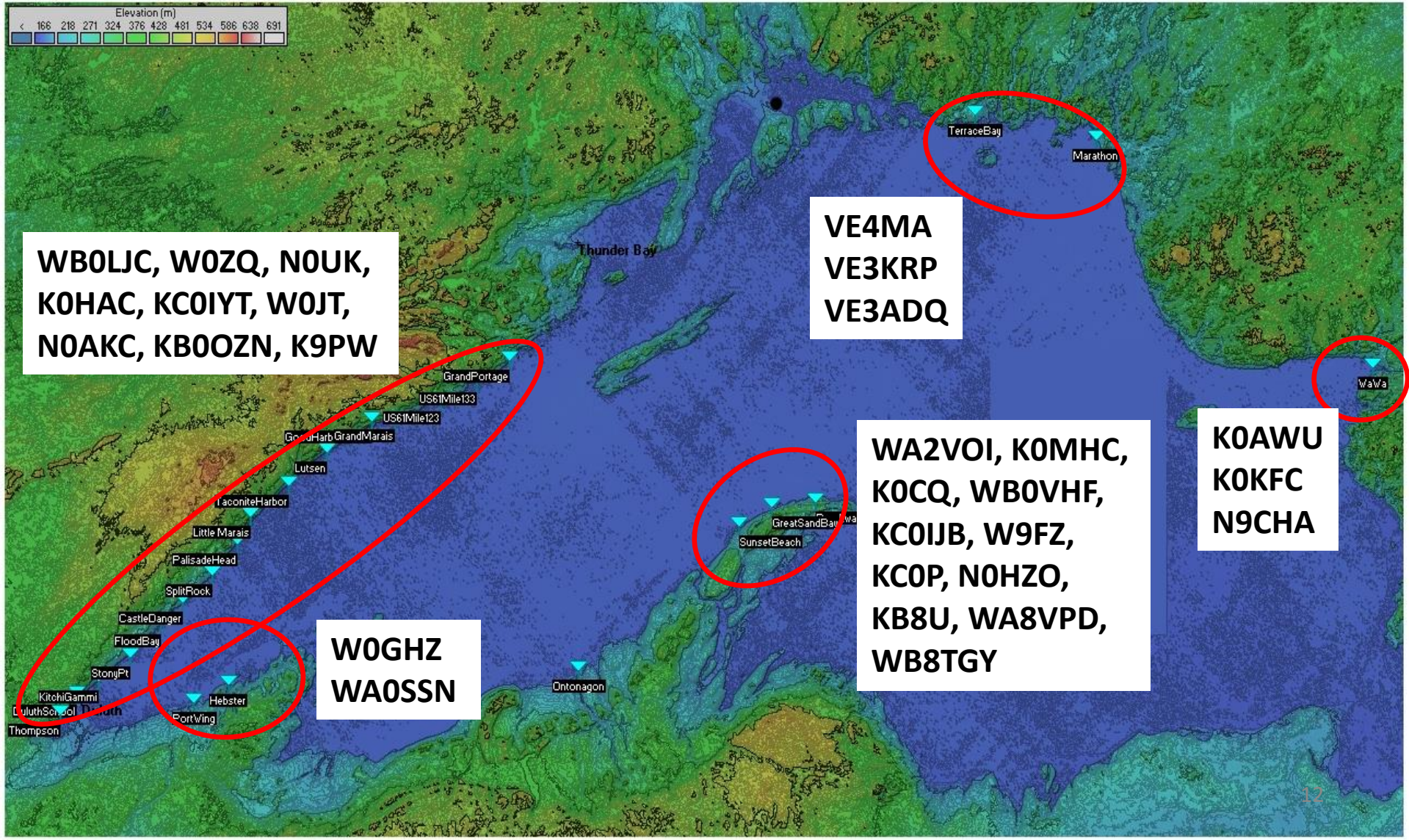
NLRS History With Lake Superior

2001 & 2002: Short one-day visits were made to Lake Superior with generally good results using WBFM to 10mW to 2 watt SSB/CW systems. We wondered "*What if we made a major effort*?".

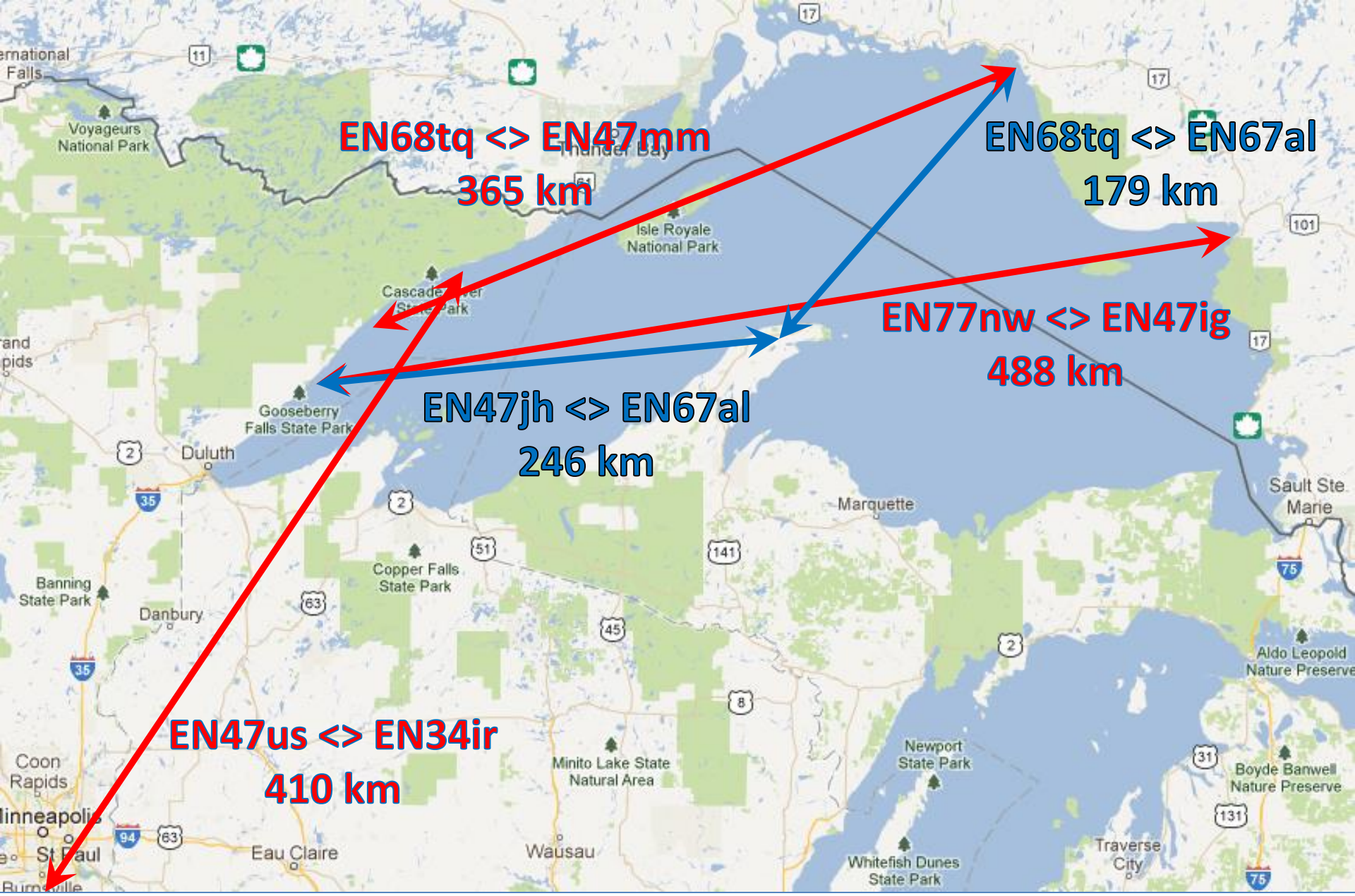
2003: 18 stations around the lake. Experimentation with High/Low.

2004: Major effort that included expedition to WaWa and VE3. Repeat of High/Low with UHF bands. No contacts were made across the wide part of the lake.

Planning A Return For the 2012 10GHz Contest



North Shore Rover Pack (9)



A Summary Of 10 And 24 GHz Contacts

K0AWU	KB8U	N9CHA	W9FZ
K0CQ	KC0IJB	VE3ADQ	WA0SSN
K0HAC	KC0IYT	VE3KRP	WA2VOI
K0KFC	KC0P	VE4MA	WA8VPD
K0MHC	N0AKC	W0GHZ	WB0LJC
K9PW	N0HZO	W0JT	WB0VHF
KB0OZN	N0UK	W0ZQ	WB8TGY

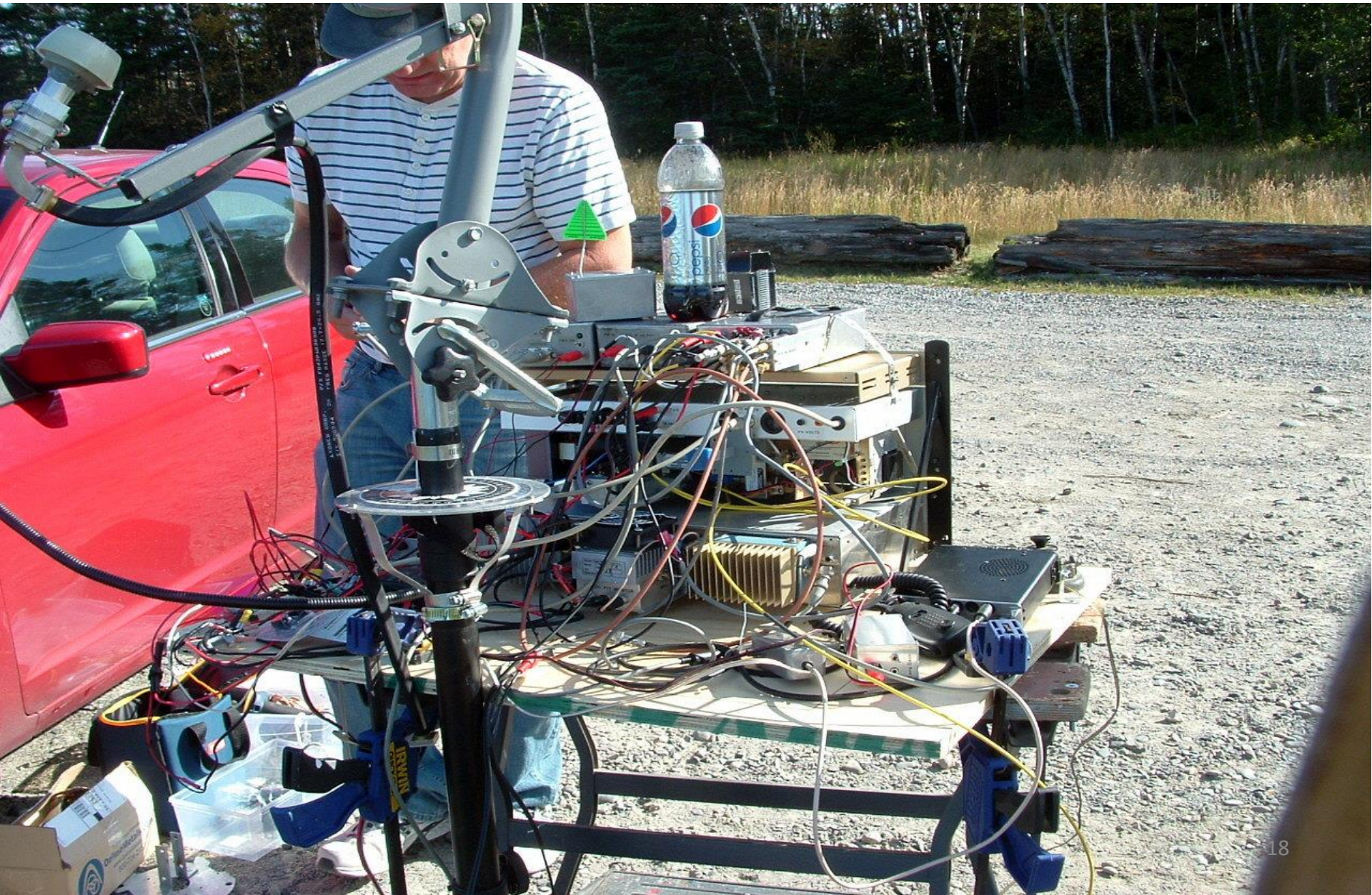
NLRS-2012 10 GHz only

#	Call	Score	Category	Area	QSOs	Calls Worked	Distance Points	10 GHz Best DX	24 GHz Best DX	47 GHz Best DX	75 GHz Best DX	300+ GHz Best DX
	WB0LJC	78,233	10G	0	351	29	75,333	387	0	0	0	0
	N0UK	71,078	10G	0	305	28	68,278	410	0	0	0	0
	K0HAC	64,168	10G	0	282	26	61,568	314	0	0	0	0
4	KD6W	62,505	10G	6	262	37	58,805	475	0	0	0	0
	N0AKC	58,931	10G	0	256	25	56,431	313	0	0	0	0
6	K6ML	55,490	10G	6	219	56	49,890	493	0	0	0	0
7	N6NU	55,438	10G	6	231	37	51,738	533	0	0	0	0
	K0CQ	54,801	10G	8	239	30	51,801	331	0	0	0	0
	WA2VOI	51,167	10G	9	226	26	48,567	314	0	0	0	0
10	KK6MK	50,196	10G	6	205	41	46,096	652	0	0	0	0
	WB0VHF	49,344	10G	0	221	30	46,344	326	0	0	0	0
	K0MHC	49,108	10G	0	222	37	45,408	380	0	0	0	0
	KC0P	48,819	10G	8	232	33	45,519	314	0	0	0	0
14	N6VI	39,798	10G	6	210	52	34,598	526	0	0	0	0
	N0HZO	35,987	10G	8	170	29	33,087	314	0	0	0	0
	W0AUS (W9FZ, op)	34,589	10G	8	148	32	31,389	377	0	0	0	0
	W0JT	33,413	10G	0	161	25	30,913	314	0	0	0	0
	KB8U	33,302	10G	8	159	32	30,102	401	0	0	0	0
	N0KP	29,625	10G	0	122	18	27,825	410	0	0	0	0
20	N6DN	27,838	10G	6	169	48	23,038	492	0	0	0	0
21	W6YLZ	27,829	10G	6	113	45	23,329	526	0	0	0	0
22	K6NKC	26,629	10G	6	124	42	22,429	476	0	0	0	0
23	W6SR	25,035	10G	6	88	27	22,335	529	0	0	0	0
24	N9RIN	23,212	10G	6	107	38	19,412	526	0	0	0	0
25	KC6UQH	22,071	10G	6	103	39	18,171	422	0	0	0	0

NLRS-2011 10 GHz only

#	Call	Score	Category	Area	QSOs	Calls Worked	Distance Points	10 GHz Best DX	24 GHz Best DX	47 GHz Best DX	75 GHz Best DX	300+ GHz Best DX
1	WB0LJC	74,981	10G	0	360	25	72,481	331	0	0	0	0
2	W0ZQ	49,094	10G	0	236	21	46,994	414	0	0	0	0
3	WA2VOI	46,885	10G	0	220	25	44,385	246	0	0	0	0
4	KK6MK	43,483	10G	6	177	47	38,783	652	0	0	0	0
5	N0UK	42,653	10G	0	198	27	39,953	331	0	0	0	0
6	K0HAC	40,958	10G	0	192	25	38,458	299	0	0	0	0
7	AF6NA	40,674	10G	6	156	60	34,674	529	0	0	0	0
8	WA6JBD	39,829	10G	6	125	46	35,229	840	0	0	0	0
9	N0KP	38,114	10G	0	187	26	35,514	362	0	0	0	0
10	W7XU	37,450	10G	0	169	17	35,750	361	0	0	0	0
11	N9RIN	37,351	10G	6	169	50	32,351	492	0	0	0	0
12	KC0P	35,581	10G	0	176	29	32,681	247	0	0	0	0
13	AF1T	34,081	10G	1	132	43	29,781	641	0	0	0	0
14	KD0EJT	33,915	10G	6	157	50	28,915	492	0	0	0	0
15	W6SR	33,555	10G	6	114	45	29,055	570	0	0	0	0
16	K6WCI	32,659	10G	6	148	49	27,759	492	0	0	0	0
17	W1MKY	30,997	10G	1	126	42	26,797	608	0	0	0	0
18	W0JT	29,410	10G	0	148	23	27,110	247	0	0	0	0
19	N6DN	29,137	10G	6	164	52	23,937	492	0	0	0	0
20	N0EDV	28,611	10G	0	120	26	26,011	362	0	0	0	0
21	KH6WZ	25,901	10G	6	128	29	23,001	508	0	0	0	0
22	N0AKC	25,835	10G	0	127	25	23,335	362	0	0	0	0
23	KC6UQH	25,465	10G	6	118	35	21,965	455	0	0	0	0
24	W1AUV	21,969	10G	1	103	31	18,869	360	0	0	0	0
25	W6OYJ	21,287	10G	6	107	41	17,187	426	0	0	0	0

aTypical NLRS 10 GHz Station



Typical NLRS 10 GHz Station

Organizing & Planning µW Activities

"Replicating Success"

- **On-line database:**
  - **Operators contact information**
  - **Personal, "Loaner & Backup" station descriptions**
  - **Operating sites location information**
  - **Local distance records**

- **Communications:**
  - **Separate e-mail reflector**
  - **Dedicated website pages (or Blog)**
  - **Newsletters**

Organizing & Planning µW Activities

"Replicating Success"

- **Social Interactions:**
  - **Weekly coffee, Monthly breakfast & Annual conference**
- **Encouraging Involvement and Participation**
- **Support Structure**

NLRS On-line Database

- **Operator Contact Information**
  - Link removed
- **Station Configurations**
  - Loaner
  - Personal
- **10 GHz & Up Operating Sites**
  - Lake Superior
  - Upper Midwest
  - Local

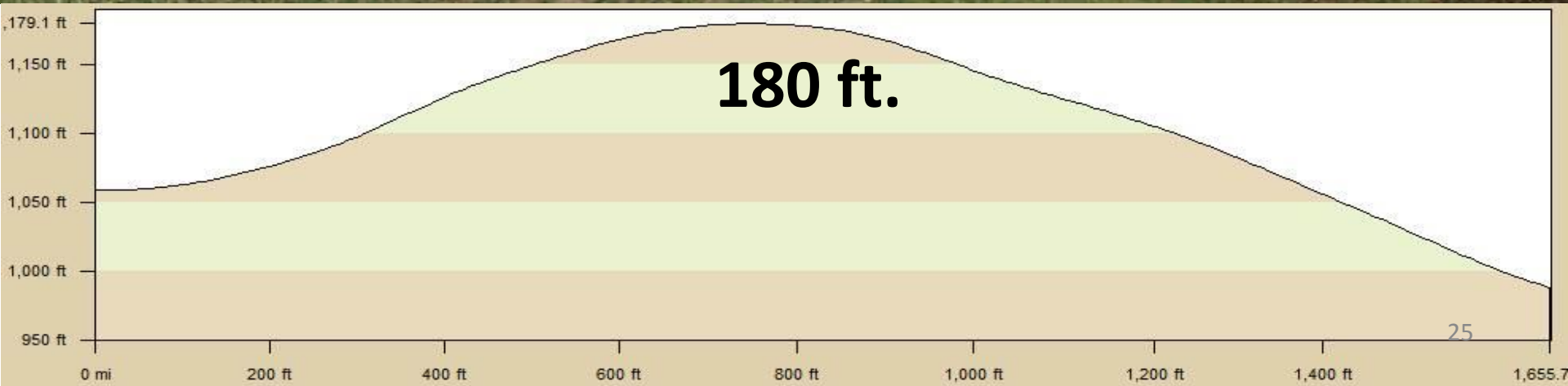
In-the-field Operations

- Assembly
- Intra-pack communications
- Navigation
  - Along planed routes
  - Calling an auditable, as required
- Coordination communications
  - Fixed site(s) to Rover pack(s)

In-the-field Operations

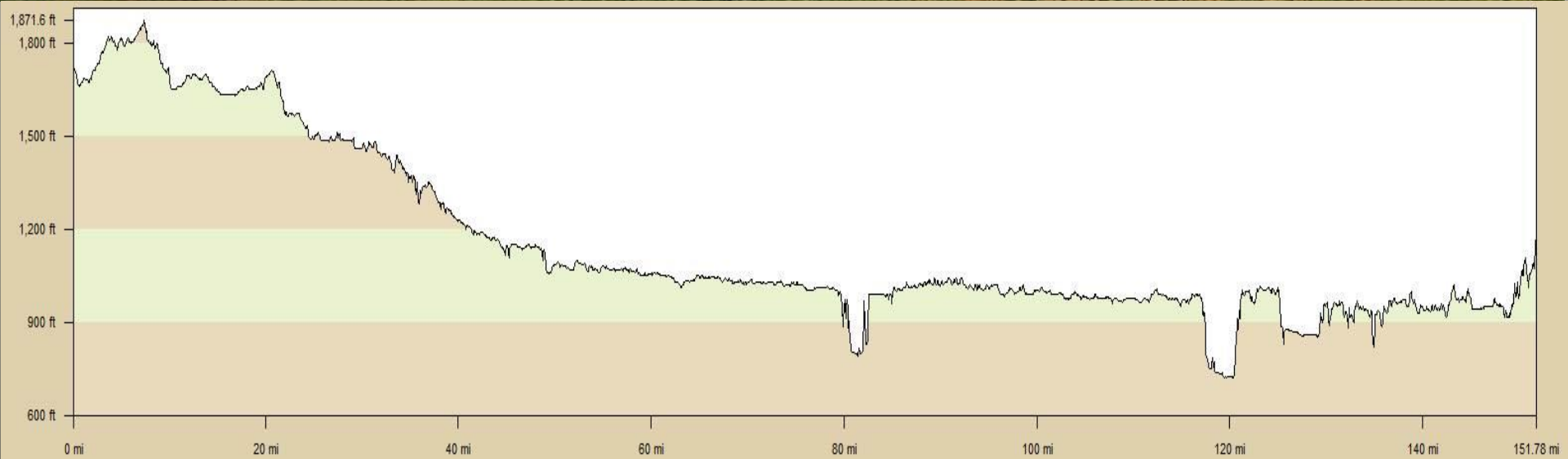
- Dish Pointing
  - Dead reckoning and beaconing
- QSO Sequences
  - Designated team captains
  - Who's on-line?
  - The rovers are in control!
- Time Management is the focus
- Have a good time!

NLRS Fixed Stations – Buck Hill



NLRS Rover Pack

DeLorme Topo Profile View

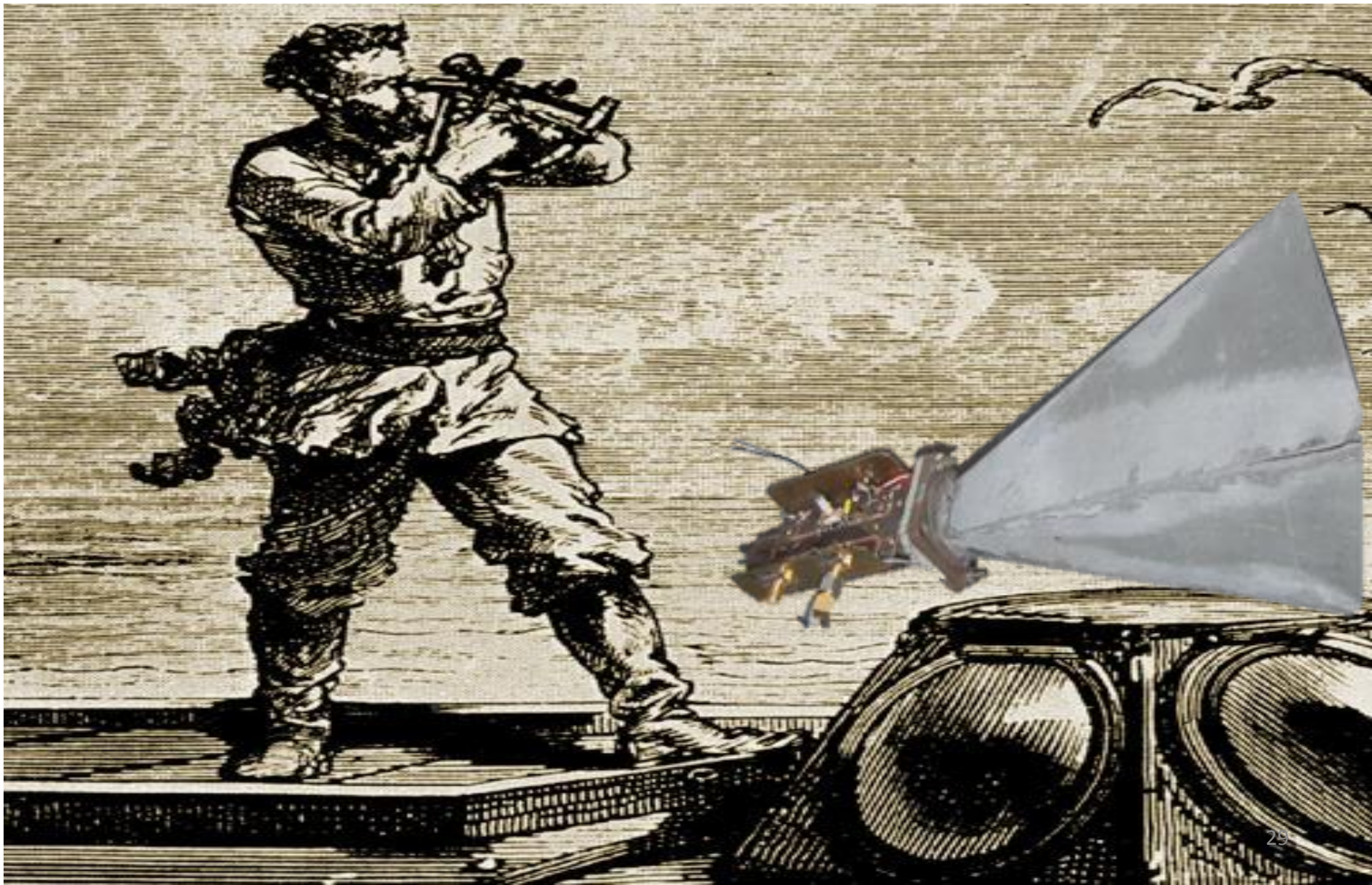


Clear, Concise Communications

Communications Options

- 2 meters (144.260 MHz)?
  - For “local” coordination
- Cellular Phones?
  - When necessary (and available)
- 10 GHz!
  - When the path is good
- HF - 10 or 80 Meters?
  - Check with the Florida group

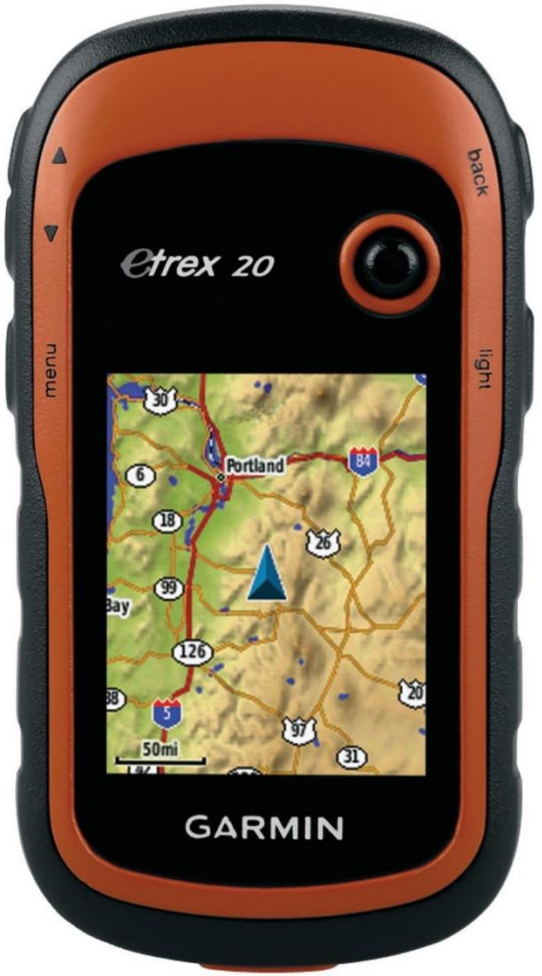
Dish Pointing - WB era



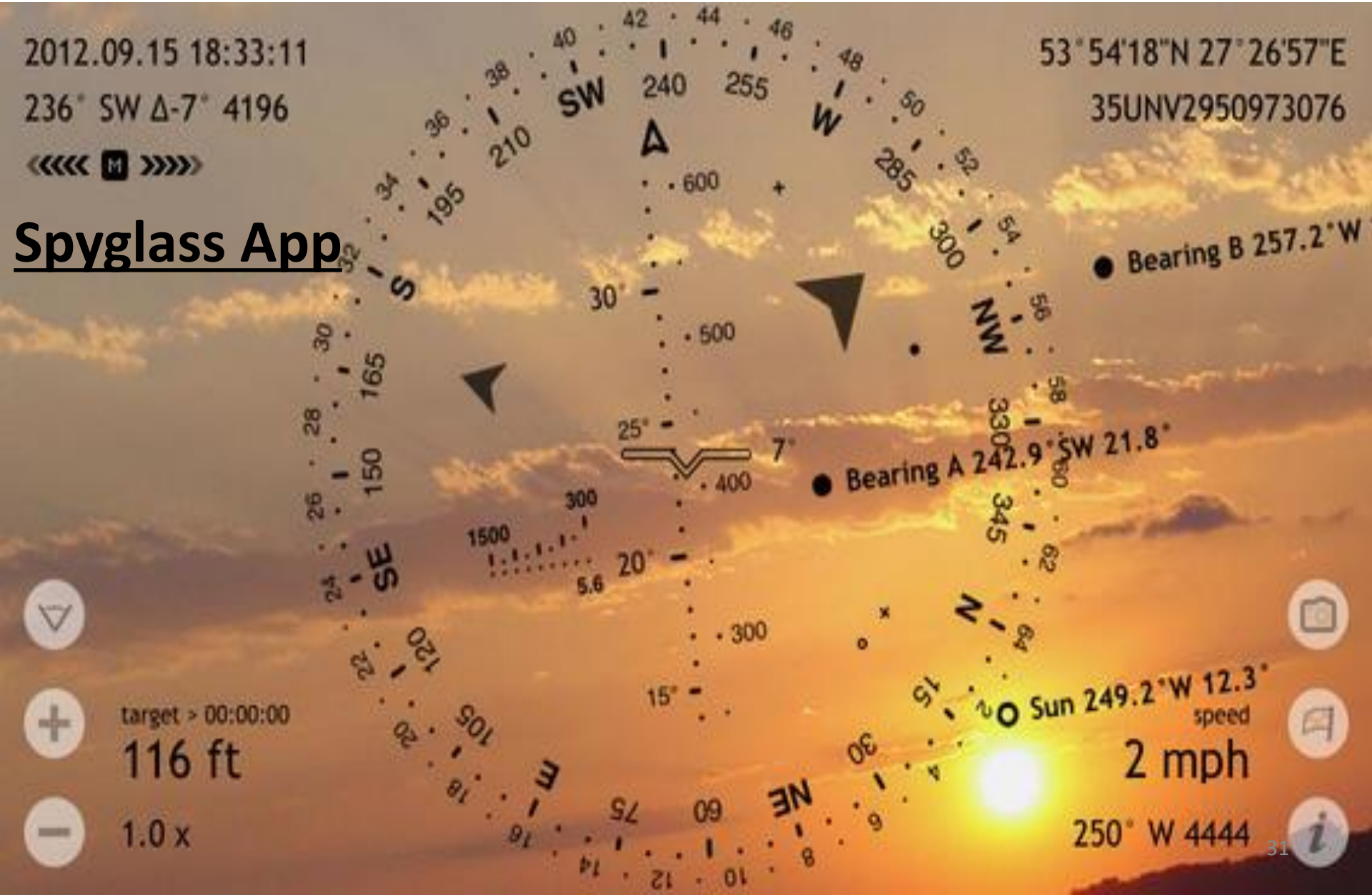
Dish Pointing – NB Era

- **Sighting Compass**

- **GPS Compass**



Dish Pointing – Smartphone Era



Dish Pointing – Smartphone Era

10 GHz & Up - Time Management

- **Two weekends = 4 days**
  - **Limited to <24 total hours per weekend**
  - **Usually sun-up to sun-down operation**
- **4 – 12 stations fixed on Buck Hill**
  - **Up to 3 other stations at various fixed sites**
- **Up to 3 rover packs in the field**
  - **Up to 12 rover sites per day**
  - **2 to 6 operators per rover pack**
- **Rover Productivity (estimated)**
  - **20 to 40 minutes travel & set-up time per site**
  - **2 minutes beaconing time per new direction**
  - **Up to 30 seconds per QSO (including repeats, etc.)**

NLRS 10 GHz Contest Results

	WB0LJC	W0ZQ	N0UK	K0HAC	WA2VOI
-2012 Score	78K	76K	71K	64k	51K
-2012 QSOs	351	336	305	282	226
-2012 Km	387	410	410	314	314
-2011 Score	75K	49K	43K	41K	47K
-2011 QSOs	360	236	198	192	220
-2011 Km	331	414	331	299	246
-2009 Score	76K	75K	75K	75K	54K
-2009 QSOs	387	383	380	378	294
-2009 Km	306	322	322	322	295

But, One Size Doesn't Fit All!

Do your own thing!

But, One Size Doesn't Fit All!

- You need to do what makes sense for your organization. Try something different.
- Prepare to learn from your mistakes.
- Joint field operations encourage cooperation.
- Some may choose to focus on technical innovation rather then operating. They can also contribute through elmering.
- Share your results to build momentum.

References

- Weak Signals >HF Bands
- NLRS 10GHz
- SBMS
- PACKRATS
- Hill Country Rovers
- CSVHFS

Questions?

Thanks for your attention!