



GMRS RADIO 101

FOR OFF-ROAD AND OUTDOOR ACTIVITIES

Brent Christensen, March 2024

WRMC320

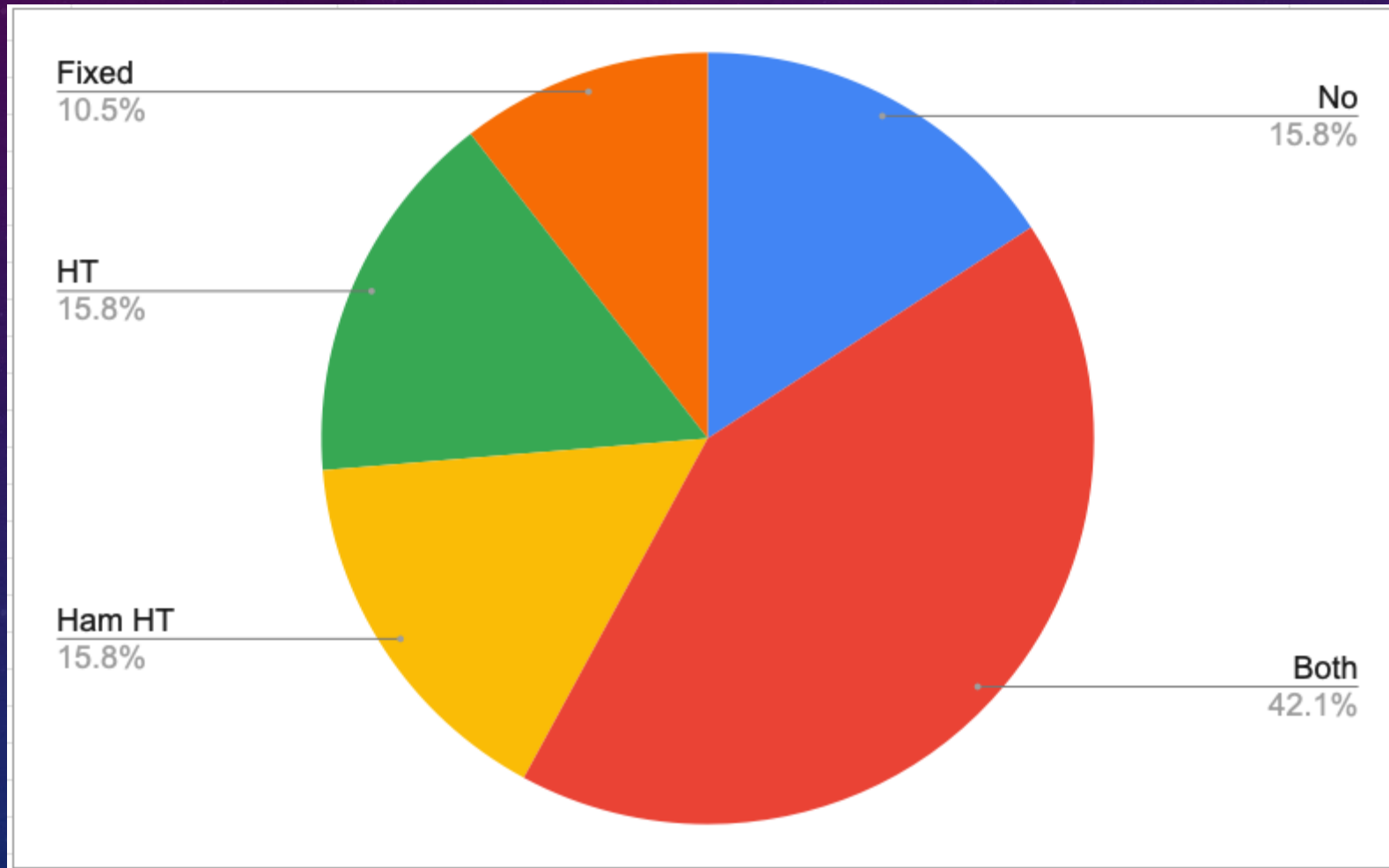
DISCLAIMER

Everything covered during this session is my opinion based on a few years of experience & tinkering. Anyone could duplicate my “expertise” with a few dozen hours of watching YouTube videos...

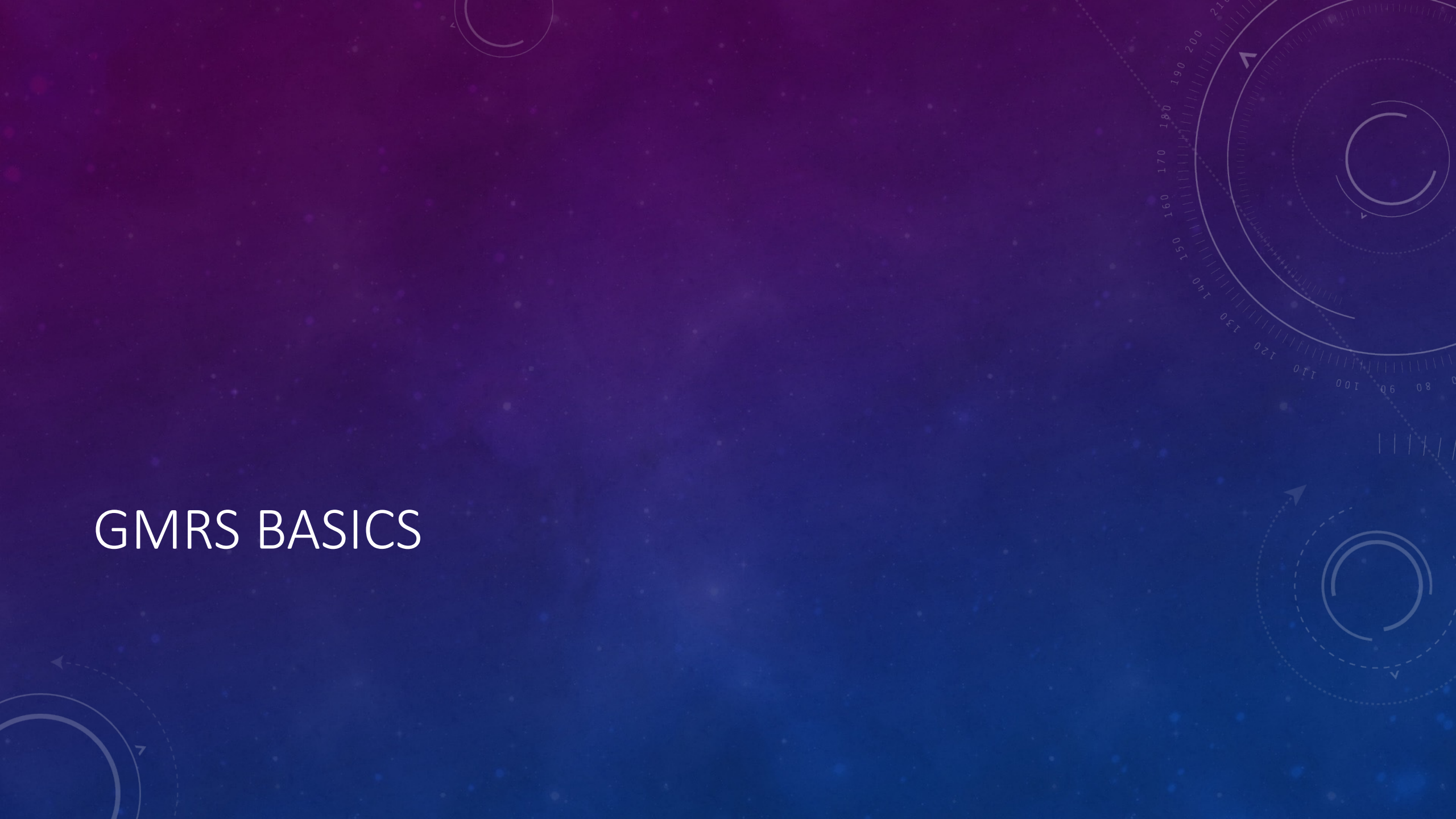
My opinions are just that – opinions. They are informed opinions but they are subject to change!

Use the information provided in this session to make your own decisions!

CLUB SURVEY



GMRS BASICS



WHY GMRS?

(General Mobile Radio Service)

- Easy to use, like CB
- Better quality than CB (AM vs. FM)
- Includes FRS frequencies/channels
- Allows more power than CB but does not require taking a test
- **Many** equipment options but generally less expensive than ham gear



COMPONENTS OF A GMRS RADIO SYSTEM



Radio & Mic



Antenna Cable



Antenna

Other Stuff you'll need:

- 12v Power source (amperage depends on radio wattage)
- Antenna mount

Optional

- Mic Hanger
- External Speaker

GMRS/FRS CHANNELS & FREQUENCIES

FRS

SB4x4 1

SB4x4 2

Channel	Frequency MHz	Radio Service	Max Permitted Power	
			FRS	GMRS
1	462.5625	FRS or GMRS	2 watts	5 watts
2	462.5875	FRS or GMRS	2 watts	5 watts
3	462.6125	FRS or GMRS	2 watts	5 watts
4	462.6375	FRS or GMRS	2 watts	5 watts
5	462.6625	FRS or GMRS	2 watts	5 watts
6	462.6875	FRS or GMRS	2 watts	5 watts
7	462.7125	FRS or GMRS	2 watts	5 watts
8	467.5625	FRS or GMRS	.5 watts	.5 watts
9	467.5875	FRS or GMRS	.5 watts	.5 watts
10	467.6125	FRS or GMRS	.5 watts	.5 watts
11	467.6375	FRS or GMRS	.5 watts	.5 watts
12	467.6625	FRS or GMRS	.5 watts	.5 watts
13	467.6875	FRS or GMRS	.5 watts	.5 watts
14	467.7125	FRS or GMRS	.5 watts	.5 watts
15	462.5500	FRS or GMRS	2 watts	50 watts
16	462.5750	FRS or GMRS	2 watts	50 watts
17	462.6000	FRS or GMRS	2 watts	50 watts
18	462.6250	FRS or GMRS	2 watts	50 watts
19	462.6500	FRS or GMRS	2 watts	50 watts
20	462.6750	FRS or GMRS	2 watts	50 watts
21	462.7000	FRS or GMRS	2 watts	50 watts
22	462.7250	FRS or GMRS	2 watts	50 watts



Also used for Repeaters

“CTCSS TONES” OR “PRIVACY CODES”

- What is “Squelch”?
- Why SB4WDC uses tones
- Midland “Codes” or “sub channels”
- OPPOSITE of “privacy”—*everyone can hear you, but you hear no other traffic*



Model MXT115

CTCSS Privacy Codes Frequency Chart

Code	Freq.	Code	Freq.	Code	Freq.	Code	Freq	Code	Freq
1	67.0 9	9	91.5	17	118.8	25	156.7	33	210.7
2	71.9	10	94.8	18	123.0	26	162.2	34	218.1
3	74.4	11	97.4	19	127.3	27	167.9	35	225.7
4	77.0	12	100.0	20	131.8	28	173.8	36	233.6
5	79.7	13	103.5	21	136.5	29	179.9	37	241.8
6	82.5	14	107.2	22	141.3	30	186.2	38	250.3
7	85.4	15	110.9	23	146.2	31	192.8		
8	88.5	16	114.8	24	151.4	32	203.5		

FIXED VS. HT RADIOS



ADVANTAGES OF FIXED RADIO

- Higher Power
- Better Antenna
- Improved sound quality
- Easier/Safer to use
- *Reliable power (no battery to go dead)*
- *You'll never forget to bring it!*





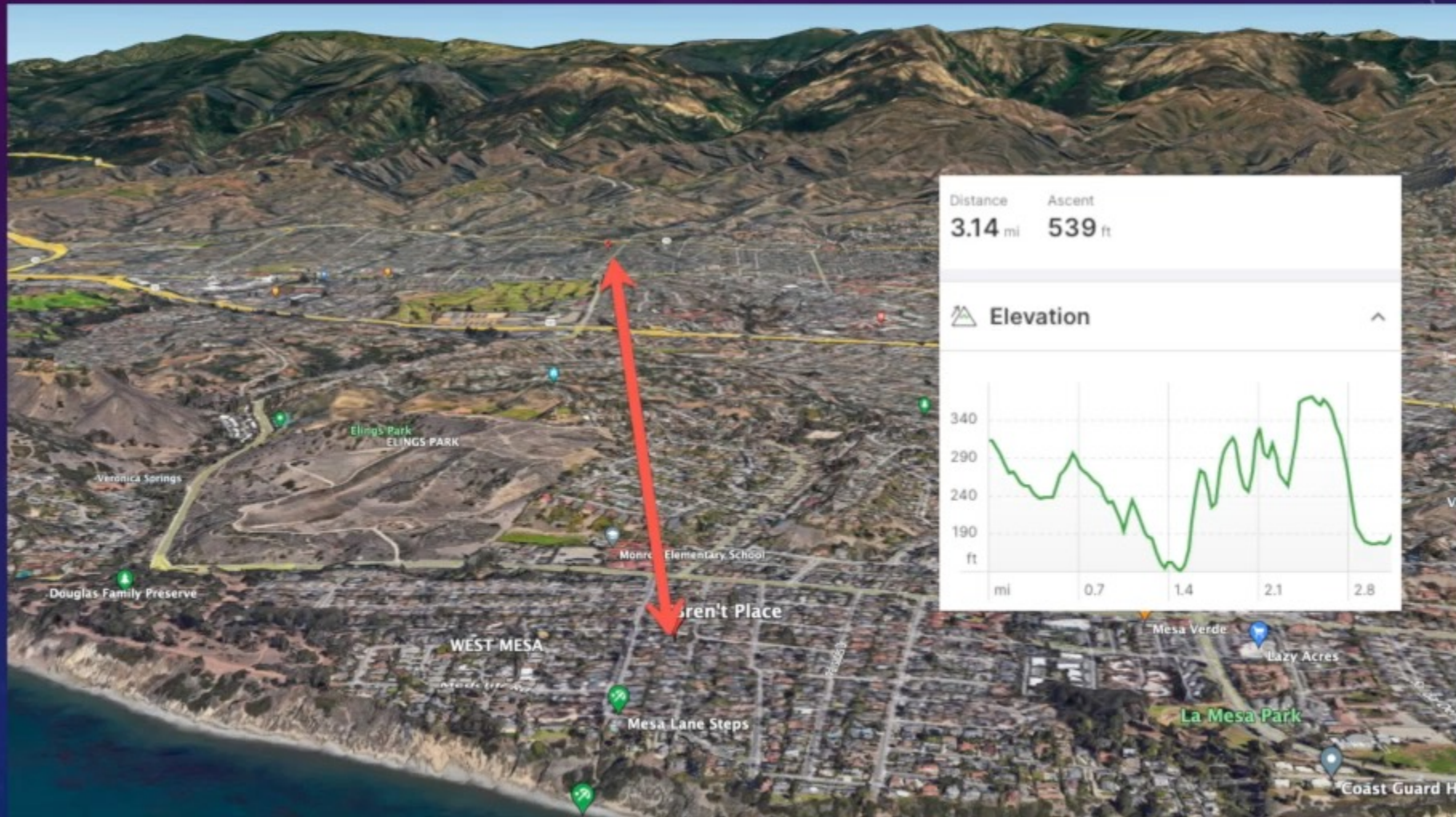
HT VS. FIXED PERFORMANCE TEST

TESTING HT VS. FIXED

- ~~1. Baofeng 8w HT to GM-30 6w HT~~
2. Baofeng 8w HT to Wouxun 50w mobile
3. Wouxun 50w mobile to Wouxun 50w mobile



RADIO PERFORMANCE TEST



Kirk

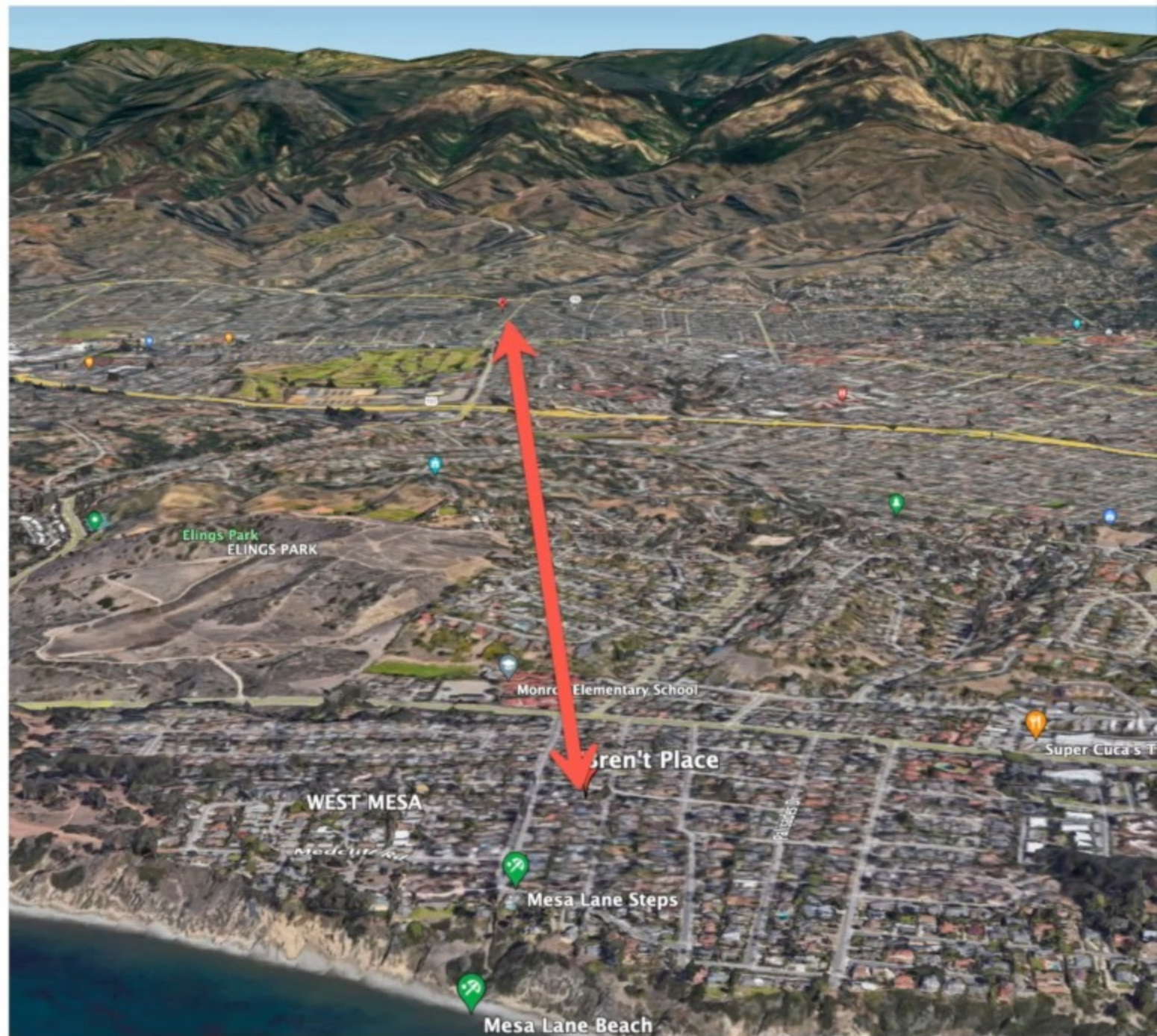
50w KG1000-G, 3db stealth antenna

Brent

50w KG1000-G, 6db whip antenna

Distance Ascent
3.14 mi **539** ft

 **Elevation** 



RADIO BRANDS TO GET?



Radioddity



COMMON INSTALLATION SCENARIOS

Overhead



Passenger Knee well



Dash (KG1000-G faceplate)



GMRS ANTENNA SELECTION

The background is a gradient from dark purple at the top to deep blue at the bottom, filled with a pattern of small, light blue dots resembling a starry sky. On the right side, there are several faint, white technical diagrams. These include a large circular scale with degree markings from 0 to 210, concentric circles with arrows indicating rotation, and other geometric shapes like dashed lines and smaller circles with arrows, suggesting a technical or scientific theme.

PICKING AN ANTENNA

- **Must be tuned for GMRS (460MHz to 470MHz)**
- **“HEIGHT IS MIGHT” - antenna type & quality has more effect than radio power!**
- Decide on a mounting location
 - Is magnetic mount an option?
 - Do you have a roof rack?
 - Tire carrier, front cowl, or A Pillar
 - Bumper
- Then select a mount type
 - Magnetic (either attached or NMO)
 - Hole-mount NMO
 - PL259
 - Spring or no spring?



Example Antenna Types



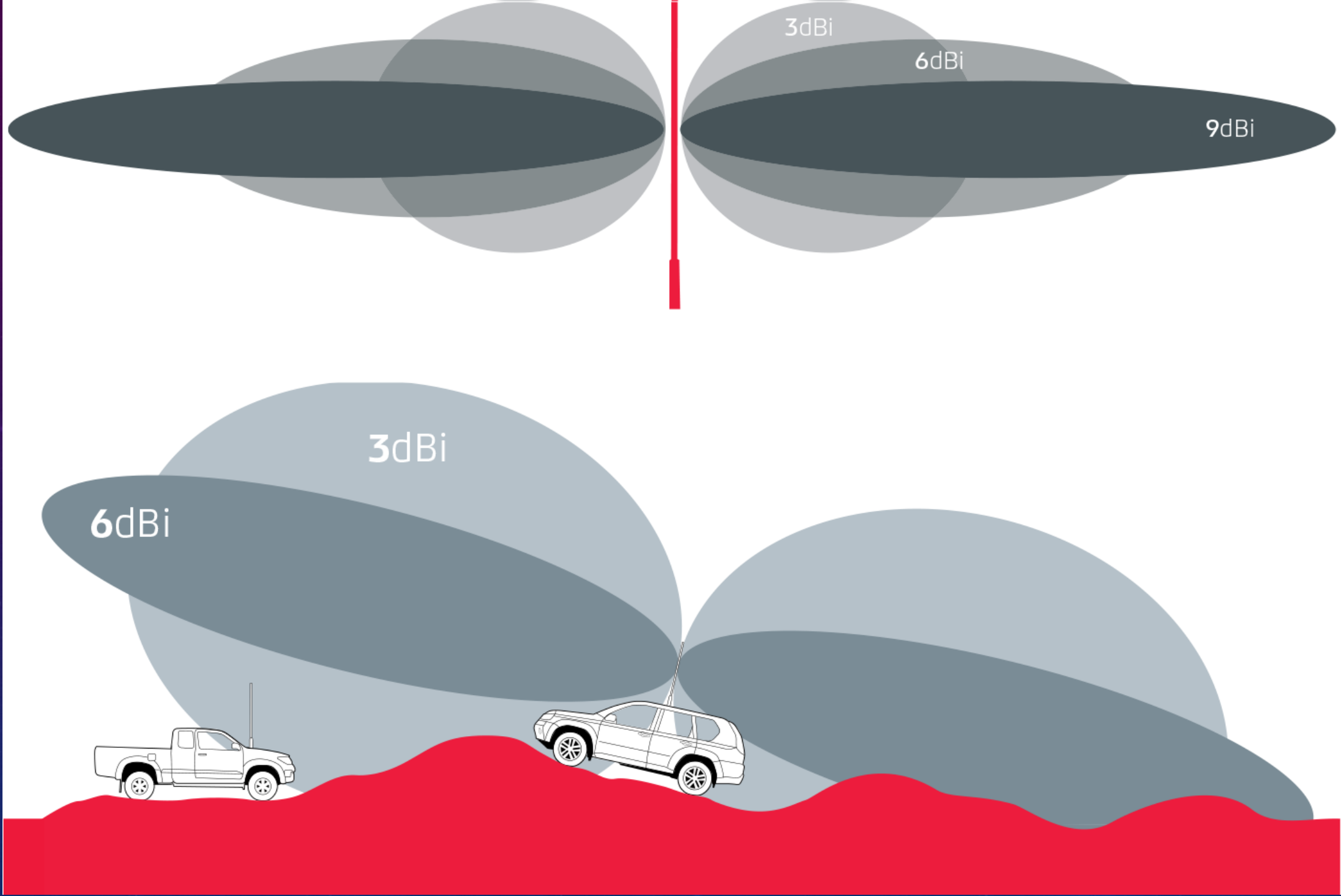
	MXTA13	MXTA51	MXTA25	MXAT03	MXAT05	MXTA26	MXAT04	MXAT01
Gain	2.1dB	2.1dB	3dB	3dB	3dB	6dB	6.6dB	7.5dB
Bullbar / Tire Carrier				•	•		•	•
Roof Rack	•	•	•			•		
Hood / Trunk	•	•	•			•		
Bracket Mount	•	•	•	•		•	•	•
Ditch Light	•	•	•		•	•		
Jeep JK	•	•	•	•		•	Images Not to Scale!	

WHAT THE HECK
IS "GAIN"??

...AND DOES IT *MATTER*???



UNDERSTANDING “GAIN”



MOUNTING OPTIONS



Hole mount



Magnetic mount

NMO



Mag Mount

Fixed



SO239 – hole mount



PL259

Hole

NMO OPTIONS

Built-In

Midland MXTA27A



DIY

Midland MXTA24



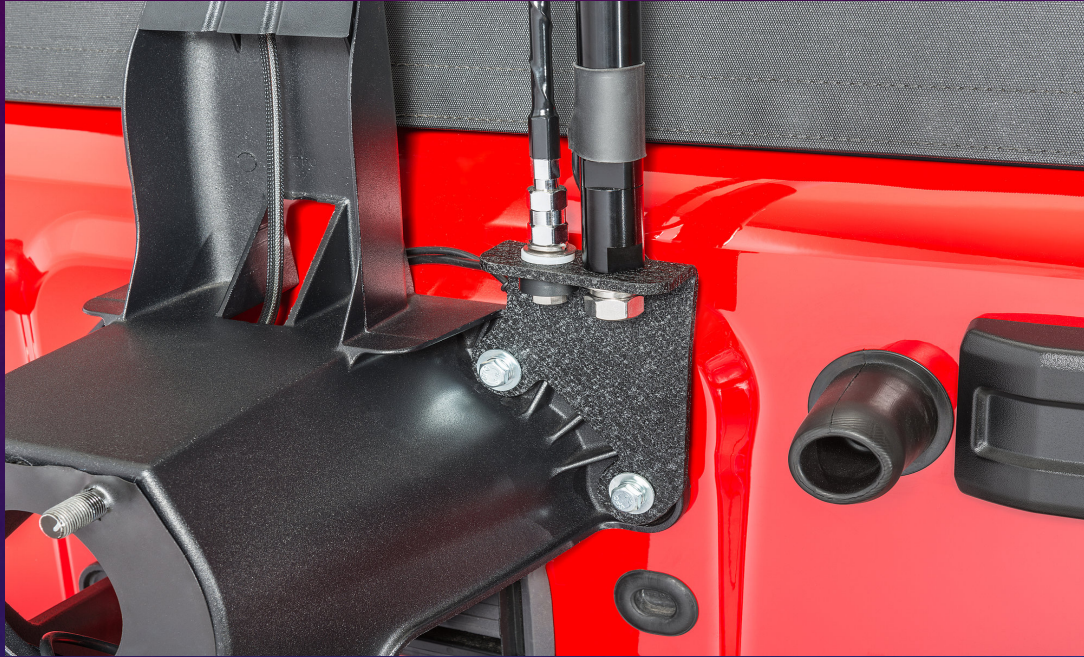


LIP MOUNT EXAMPLE

DIY BRACKET EXAMPLES



Spare Tire Carrier





BASIC RADIO OPERATIONS



BASIC MILITARY RADIO OPERATIONS
SECONDARY RECORDING RADIO
SECONDARY RECORDING RADIO

THE BASICS – DO'S AND DON'TS

- Key the mic BEFORE you talk – “Key, Pause, Talk”
- Unkey the mic AFTER you finish talking – “Talk, Pause, Unkey”
- Hold the mic close to your mouth
- Make sure no one else is transmitting (or use BCL on your radio)
- Don't put HT's in a cupholder!
- Set power level appropriately

SETUP TIPS

- Depending on your radio, use “custom channels” for SB4x41 & 2
- Set all GMRS channels to **Wide Band**
- Learn to change power level on the fly (L/M/H)
- Keep the manual in the glove box!

IMPORTANT USE CASES

Alerting others of an obstacle or possible danger

- *“Oncoming group of side-by-sides, moving very fast”*

Checking on a vehicle behind you

- *“Hey Jim, everything OK back there?”*

Alerting the leader that someone needs to stop

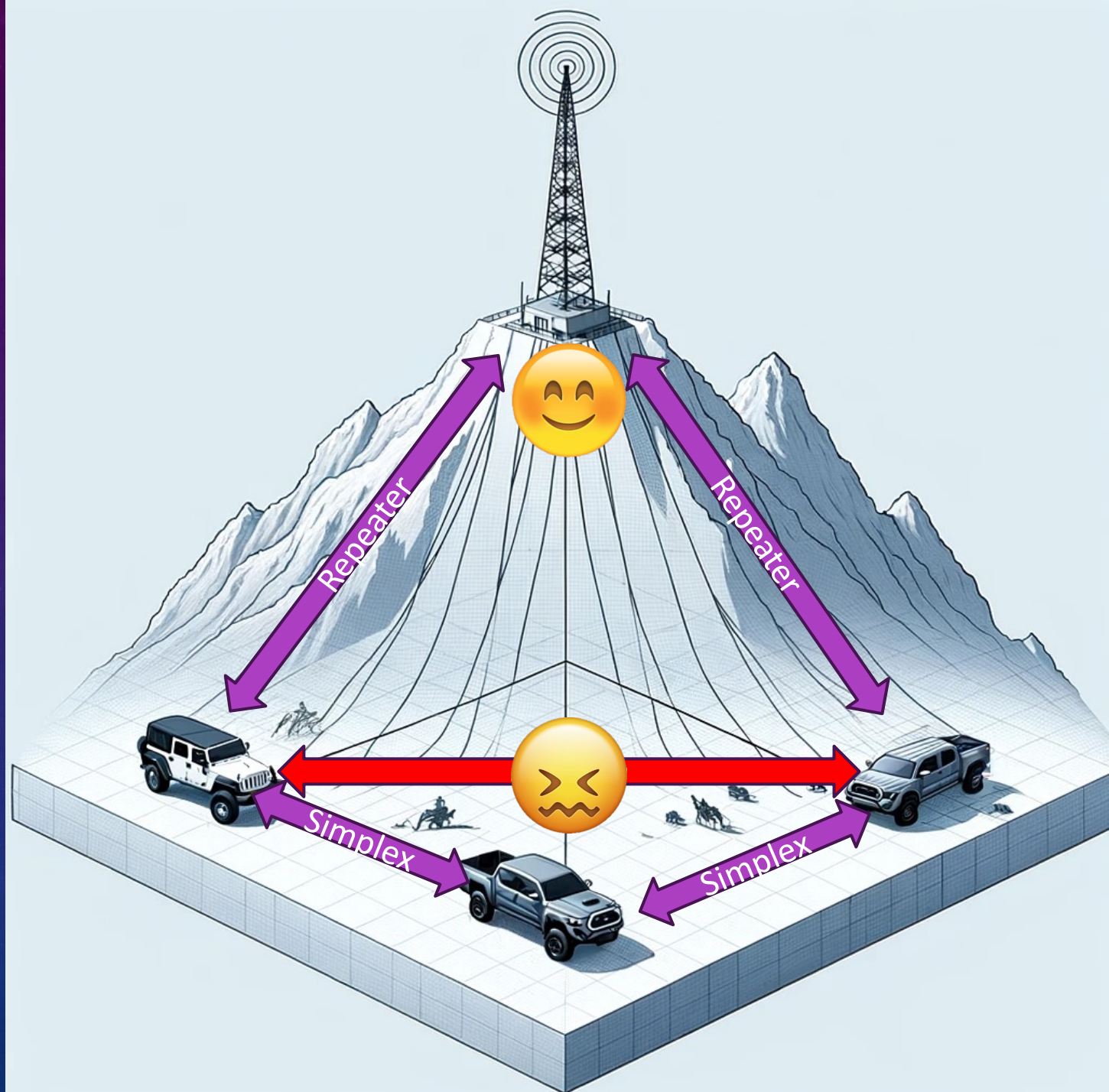
- *“Hey Dick, it looks like Bryan lost the bead on his tire – we need to stop”*



And of course – just chatting about stuff!

Linked Repeaters

Repeaterbook



GMRS LICENSING

- Get a GMRS Call Sign
- No Test – its like a fishing license
- \$35 for 10 years, includes your family
- Great guide at
<https://www.notarubicon.com/how-to-get-a-gmrs-license-easy-guide-to-gmrs-licensing-on-the-fcc-website/>

THAT'S IT!

*Now you probably know more than you ever thought you
wanted to about GMRS radios!*