📡 Welcome to the "Weird End" of the Spectrum

33 cm & 23 cm Weak Signal Operating

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Alright… if you've made it here, you've either:

1. Already fallen down the VHF/UHF weak signal rabbit hole
2. Or you're about to make a series of decisions your wallet will deeply regret

Either way… welcome to **33 cm (902 MHz)** and **23 cm (1296 MHz)**—where things get *serious*, *technical*, and occasionally *ridiculous*.

🧠 First, Let's Set Expectations

If you're coming from HF or even 2 meters, you're probably thinking:

"Cool, I'll just turn the dial, call CQ, and make contacts."

No… no you won't.

On these bands, you don't "spin the dial."

👉 You **hunt**

👉 You **schedule**

👉 You **engineer your station like a NASA side project**

And when you finally make a contact?

You will celebrate like you just landed Apollo 11.

📡 What Are 33 cm and 23 cm Anyway?

🔷 33 cm (902–928 MHz)

- Known as the “forgotten band”
- Shared with Part 15 devices (aka: your neighbor’s garage door opener and WiFi junk)
- Surprisingly useful for regional weak signal work

🔷 23 cm (1240–1300 MHz)

- The **gateway drug to microwave**
- Where weak signal operators start getting *very* serious
- Home of:
  - Long distance tropo
  - EME (moonbounce)
  - Some absolutely insane contacts

😂 Why Would Anyone Want to Operate Here?

Great question.

Because:

👉 **Nobody else is here**

👉 **The noise floor is low**

👉 **The challenge is high**

👉 **The bragging rights are permanent**

Also…

Because once you make your first 23 cm contact, you’ll never look at 2 meters the same way again.

📊 What Can You Actually Expect?

Let’s keep this honest.

📡 33 cm Expectations

- Typical range: 20–100 miles (simplex, line-of-sight)
- With effort: 150–300 miles via tropo
- Reality: You will spend more time finding people than working them

📡 23 cm Expectations

- Typical range: 50–150 miles (SSB/CW)
- With good conditions: 300–600+ miles
- With skill (and some obsession): **1000+ miles**

👉 Yes… 1000 miles on 23 cm is real.

👉 No… it is not easy.

👉 Yes… you will tell that story forever.

🏆 “Wait… People Really Do That?”

Oh yeah.

Some highlights in the weak signal world:

- **1000+ mile 23 cm contacts** (tropo ducts)
- **EME contacts** bouncing signals off the moon
- Multi-band ops running:
  - 50 MHz
  - 144 MHz
  - 432 MHz
  - **902 MHz**
  - **1296 MHz**

At the same time…

Because apparently sleep is optional.

⚖️ Pros and Cons

👍 Pros

1. Low Noise Floor

Compared to HF:

It’s like going from a crowded bar… to a quiet library.

2. Massive Technical Satisfaction

Every contact feels *earned*

3. Antennas Are Manageable

- High gain without needing a 60-foot tower
- Small beams = big performance

4. Weak Signal Playground

Perfect for:

- SSB
- CW
- Digital modes
- EME (if you're feeling brave… or insane)

👎 Cons

1. Line-of-Sight is King

No ionosphere here to save you.

👉 If you can't "see" them… you probably won't work them.

2. Feedline Loss Will Destroy Your Dreams

At these frequencies:

- Cheap coax = **signal murder**
- That "100 watts" at the radio?

  👉 Might be **40 watts at the antenna**

3. Equipment Isn't Plug-and-Play

This isn't:

"Buy radio → hook up antenna → done"

This is:

"Research → build → test → swear → improve → repeat"

4. Activity Levels

Sometimes it feels like:

“Is anyone even alive on this band?”

(They are… they’re just on a different hilltop with a better takeoff angle than you.)

🔧 Station Design (This is Where You Win or Lose)

🧰 The Golden Rule:

👉 **Antenna system beats power. Every time.**

📡 Basic 33 cm Station

- Radio or transverter (902 MHz capable)
- 10–50 watts
- Modest Yagi (10–20 elements)
- **Low-loss coax (LMR-400 minimum)**

📡 Basic 23 cm Station

- Transverter or radio (like Icom IC-9700)
- 10–100 watts (more if you’re serious)
- High gain Yagi (20–50 elements) or small dish
- **VERY low-loss coax (LMR-600, hardline, or better)**

🔥 Advanced Setup (a.k.a. “I’ve Accepted My Fate”)

- Mast-mounted preamp (mandatory for weak signal)
- Sequencing (so you don’t fry said preamp)
- High gain antennas or dishes
- Rotor system
- Accurate frequency control (these bands are not forgiving)

📡 The Real Secret to Success

It’s not power.

It’s not even antennas (though they matter).

👉 It’s **location + takeoff angle + system efficiency**

You can have:

- 500 watts
- Amazing radio

…and still lose to:

👉 A guy with 10 watts on a hilltop with a clean horizon

😄 What Operating Feels Like

First QSO:

“Did you hear me?”
“Barely… but yes!”
“YESSSSS!!!”

After a few months:

“I just worked 400 miles on 23